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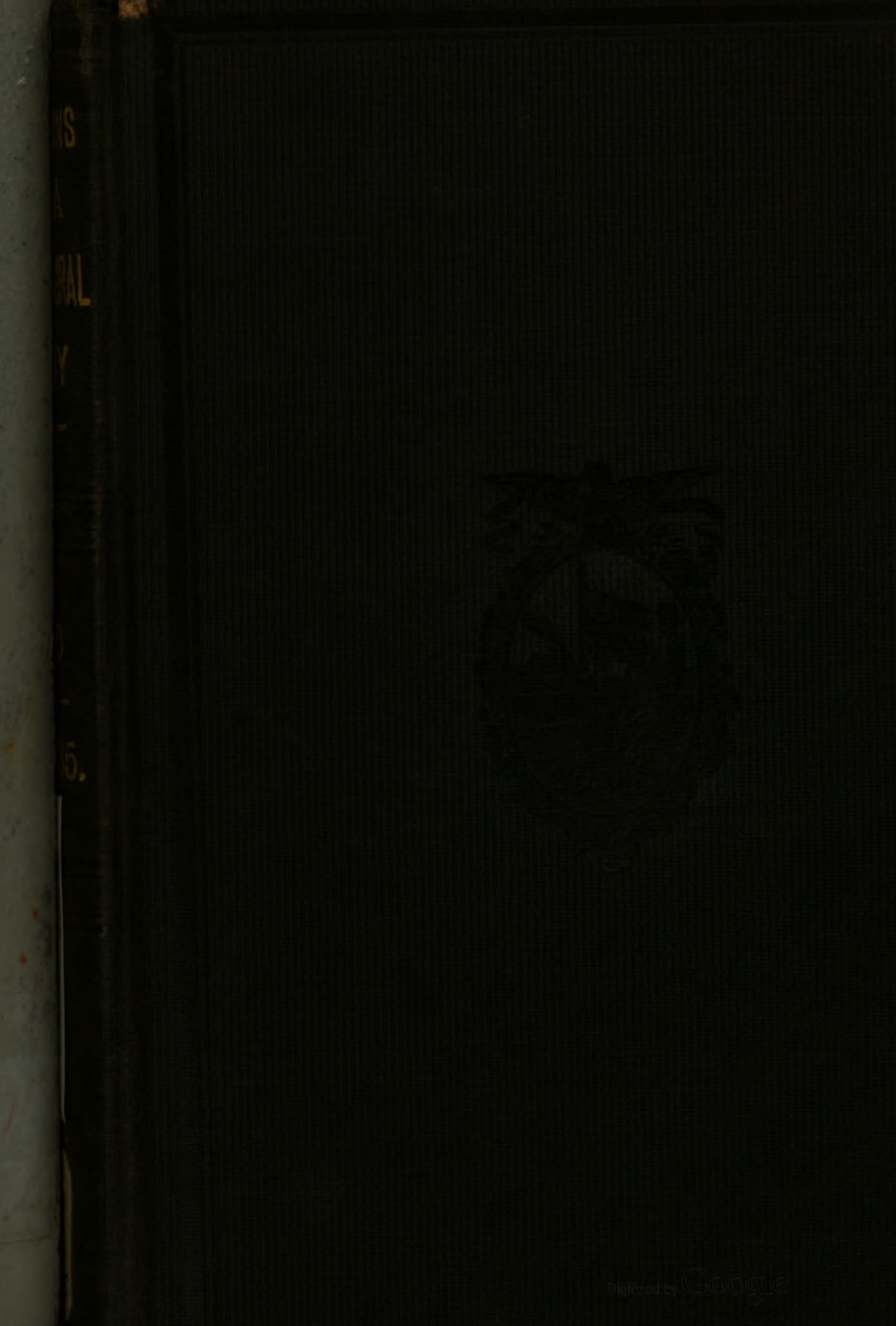

UNIVERSITY FARM

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REPORT

OF THE

IOWA STATE HORTICULTURAL SOCIETY

FOR THE YEAR 1900

CONTAINING THE PROCEEDINGS OF THE

THIRTY-FIFTH ANNUAL SESSION,

HELD AT

Des Moines, December 11, 12, 13, 14, 1900.

ALSO TRANSACTIONS OF THE

Southeastern, Northeastern, Northwestern and Southwestern Horticultural Societies.

EDITED BY THE SECRETARY.

VOLUME XXXV.

Published by Order of the General Assembly.

DES MOINES
BERNARD MURPHY, STATE PRINTER
1901

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LETTER OE TRANSMITTAL.

To His Excellency, Hon. L. M. Shaw, Governor of Iowa:

SIR—In compliance with the requirements of law, I have the honor of submitting to you, herewith, the thirty-fifth annual report of the Iowa State Horticultural Society, showing the receipts and disbursements for the year 1900, with supplementary papers and discussions on horticulture, including the reports of the four auxiliary societies. Very respectfully,

WESLEY GREENE,
Secretary.

Des Moines, Iowa.

16997

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OFFICERS

OF THE

IOWA STATE HORTICULTURAL SOCIETY.

M. J. Wragg, President ..... Waukee
N. K. Fluke, Vice-President ..... Davenport
Wesley Greene, Secretary and Librarian ..... Davenport
Elmer M. Reeves, Treasurer ..... Waverly

DIRECTORS.

First District—C. G. Blodgett ..... Mt. Pleasant
Second District—Abner Branson ..... New Sharon
Third District—Silas Wilson ..... Atlantic
Fourth District—William Langham ..... Cedar Rapids
Fifth District—W. O. Willard ..... Grinnell
Sixth District—A. L. Plummer ..... Ivy
Seventh District—B. Shontz ..... Correctionville
Eighth District—R. P. Speer ..... Cedar Falls
Ninth District—B. F. Ferris ..... Hampton
Tenth District—P. F. Kinne ..... Storm Lake
Eleventh District—W. A. Burnap ..... Clear Lake
Twelfth District—Eugene Secor ..... Forest City

The society keep its rooms open during the usual office hours at the capitol, and visitors are always welcome.

The society was organized for the purpose of disseminating correct information concerning the cultivation of such fruits, flowers and trees as are adapted to the soil and climate of the state. To more fully carry on this line of work, the secretary desires to keep in touch with the horticulturists of the state by correspondence, or otherwise, and asks for reports on the nature and extent of fungus diseases or insect pests which have proven destructive in the past or are noticed for the first time in any locality, and that specimens be sent to him for identification and study and as material for the museum the society is now collecting. Reports on the condition of the fruit industry solicited from fruit growers in every township in the state.

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FRUIT DISTRICTS.

REPRESENTED BY THE DIRECTORS NAMED ON PRECEDING PAGE.

First District.—Lee, Des Moines, Louisa, Henry, Washington, Jefferson, Van Buren, Keokuk, Wapello and Davis.

Second District.—Mahaska, Monroe, Appanoose, Marion, Lucas, Wayne, Clarke, Decatur, Ringgold and Union.

Third District.—Adams, Taylor, Montgomery, Page, Mills, Fremont, Pottawattamie, Cass, Audubon, Shelby and Harrison.

Fourth District.—Muscatine, Scott, Clinton, Jackson, Jones, Cedar and Linn.

Fifth District.—Benton, Johnson, Iowa, Tama, Poweshiek, Marshall and Jasper.

Sixth District.—Story, Polk, Warren, Boone, Dallas, Madison, Adair, Greene and Guthrie.

Seventh District.—Carroll, Crawford, Monona, Woodbury, Ida and Sac.

Eighth District —Dubuque, Clayton, Delaware, Fayette, Buchanan, Blackhawk and Grundy.

Ninth District.—Butler, Franklin, Hardin, Wright, Hamilton, Humboldt, Webster, Calhoun and Pocahontas.

Tenth District.—Buena Vista, Cherokee, Plymouth, Sioux and O'Brien.

Eleventh District.—Allamakee, Winneshiek, Howard, Chickasaw, Mitchell, Floyd, Worth, Cerro Gordo and Bremer.

Twelfth District.—Winnebago, Hancock, Kossuth, Emmet, Palo Alto, Dickinson, Clay, Osceola and Lyon.

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EXPERIMENT STATIONS.

COMMITTEES IN CHARGE OF STATIONS.

MEMBERS ELECTED IN 1898.

All except central station to do special work as indicated below.

*E. E. Little, central station.....Ames
C. G. Patten, crossing apples.....Charles City
P. F. Kinne, top-working apples.....Storm Lake
A. Branson, plum, cherry and stone fruit.....New Sharon
J. P. Jackson, small fruits and peaches.....Glenwood
C. L. Watrous, pears and apples.....Des Moines
R. P. Speer, crossing and top-grafting apples.....Cedar Falls
M. J. Wragg, plums, cherries and ornamentals.....Waukee

SUPERVISING COMMITTEE FOR 1901.

N. K. Fluke, for one year.....Davenport
C. L. Watrous, for two years.....Des Moines
C. F. Gardner, for three years.....Osage

* Appointed to fill vacancy caused by the resignation of Prof. John Craig.

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LIST OF MEMBERS.

HONORARY LIFE MEMBERS.

Ashton, Charles.....Guthrie Center
Bessey, Prof. C. E.....Lincoln, Neb.
Beadshear, Pres. W. M.....Ames
Brackett, G. B., U. S. Pomologist.....Washington, D. C.
Chase, F. N.....Cedar Falls
Cheney-Hand, Mrs. Mary.....Charles City
Crosby, J. O.....Garnavillo
Gaylord, Edson.....Nora Springs
*Gear, J. H.....Burlington
Hinrichs, G.....St. Louis, Mo.
Lathrop, H. W.....Iowa City
McGeehon, R. D.....Atlantic
Sage, J. R.....Des Moines
Scott, John.....Kingman Place, Des Moines
Shankland, E. B.....Jennings, La.
Swalm, Al. W.....Oskaloosa
Terry, H. A.....Crescent
Thompson, Mrs. P.....Grundy Center
Wilson, James, Secretary of Agriculture.....Washington, D. C.
Wragg, Mrs. Hannah.....Waukee

HONORARY MEMBERS.

Edwards, A. J.....Fort Atkinson, Wis.
Gano, W. G.....Parksville, Mo.
Holsinger, Maj. Frank.....Rosedale, Kan.
Robertson, Prof. William.....St. Anthony Park, Minn.
Wynn, Prof. W. H.....Ames

LIFE MEMBERS.

Arey, Prof. M. F.....Cedar Falls
Arthur, Robert C.....Des Moines
Artman, Rev. Charles.....Luverne
Atkin, D.....(Address unknown)
Bannister, Dr. M.....Ottumwa
Bacon, George S.....Des Moines
Bailey, M.....Winterset
Barker, John.....Scribner, Neb.
Bartholomew, J. L.....Moorhead
Bartholomew, N.....Des Moines
Berryhill, James G.....Des Moines

* Deceased.

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Bing, J. C.....Ottosen
Blackman, T. W.....Nevada
Blodgett, C. G.....307 E. Exchange, Mt. Pleasant
Boutelle, T. N.....1470 Seventh street, San Diego, Cal.
Branson, A.....New Sharon
Bomberger, W. M.....Harlan
Budd, Prof. J. L.....Ames
Burnap, W. A.....Clear Lake
Carpenter, O. W.....Dedham
Clute, L. G.....Greeley
Collman, A. F.....Corning
Corlett, John E.....Elkader
Councilman, S. J.....Carlisle
Curtis, B. O.....Paris, Ill.
Chaffee, John M.....Mitchellville
Craig, Prof. John.....Ithaca, N. Y.
Dayton, John F.....Waukon
Dewey, F. G.....Esmond, S. D.
Dillon, W. H.....De Soto
Double, Z.....Seymour
Edwards, M. G.....Glenwood
Eggert, Ernest.....Pendleton, Ore.
Evans, D.....405 Walnut street, Des Moines
Ferris, B. F.....Hampton
Forster, John.....Albia
Frisbee, Jerome B.....Sheldon
Fluke, N. K.....Davenport
Fowler, P. L.....Des Moines
Fultz, W. S.....Muscatine
Gardner, C. F.....Osage
Garrett, C. O.....Hastie
Goodwin, E. A.....Baxter
Goss, S. G.....Lenigh
Greene, Wesley.....Davenport
Gue, B. F.....Des Moines
Haag, J. S.....Hosper
Hallett, E. W.....Galena, Ill.
Hansen, Henry H.....Long Grove
Harris, A. W.....Sibley
Haviland, W. C.....Ft. Dodge
Heisz, E. R.....Nora Springs
Hicks, John S.....Roslyn, L. I.
Hinkley, M. E.....Mt. Vernon
Hoffman, I. W.....Roselle
Hoffman, John A.....Roselle
Hoyt, Ed.....Scotch Grove
Hoyt, B. L.....Scotch Grove
Irish, Prof. H. C.....Missouri Botanical Garden, St. Louis, Mo.
Jackson, J. P.....Glenwood
Jensen, J. W.....P. O. Box 303, Exira

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Kalb, Peter.....Scott
Kinne, P. F.....Storm Lake
Langham, William.....Cedar Rapids
Lawrence, A. H.....(Address unknown)
Larrabee, Hon. William.....Clermont
Lewis, W. H. .....Winterset
Lister, John.....Conrad Grove
Livingston, G. W.....Monroe
Lonsdale, James.....Dale City
Mathews, B. A.....Knoxville
Macaulay, T. B.....4007 Dorchester Street, Montreal, Canada
McClelland, Albert.....Rural Route No. 1, Altoona
McClelland, Gideon.....Polk
McElroy, W. O.....Newton
Meek, Dale.....Granger
Monroe, W. C.....Anamosa
Moon, R. G.....Bedford
Osborn, S. C.....Glenwood
Parsons, M. D. L.....Algona
*Parrott, Matt.....Waterloo
Patten, C. G.....Charles City
Peddie, Alex.....Emmetsburg
Phillips, Nelson G.....Cambridge, Idaho
Plummer, A. L.....Rural Route No. 1, Altoona
Porterfield, D. A .....Traer
Powell, Dr. F. M.....Glenwood
Prouty, J. N.....Humboldt
Putz, John.....Elkport
Pugsley, M.....Woodbine
Rich, O. W.....Atlantic
Rarey, Henry W.....Griswold
Raymond, H. C.....Council Bluffs
Reeves, Elmer M.....Waverly
Rohlfs, R. M. C.....Rural Route No. 4, Davenport
Rowen, James D.....Des Moines
Royer, C. B.....Dallas Center
Secor, Eugene.....Forest City
Shaul, W. H.....Des Moines
Shivvers, H.....Knoxville
Sherman, E. M.....Charles City
Shontz, B.....Correctionville
Speer, R. P.....Cedar Falls
Steigerwalt, W. F.....Carroll
Stone, John Y.....Glenwood
Sturtz, G. W.....Plainview, Neb.
Summers, Prof. H. E.....Ames
Talley, S. H.....(Address unknown)
*Tatum, L.....Springdale
Tatum, E.....West Branch

*Deceased.

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Thatcher, Jonathan.....1607 23d ave., Seattle, Wash.
Thompson, J. S. B.....Grundy Center
Town, Silas.....Canby
Trowbridge, S. A.....Des Moines
Van Houten, George H.....Lenox
Van Houten, Arthur W.....Lenox
Warburton, Clyde W.....Ames
Watrous, C. L.....Des Moines
Watrous, E. L.....Des Moines
Willard, W. O.....Grinnell
Williams, H. P.....(Address unknown.)
Williams, A. G.....Campbell, Cal.
Williams, Theo.....Benson, Neb.
Wilson, Silas.....Atlantic
Worth, W. T.....Magnolia
Wragg, M. J.....Waukee

ANNUAL MEMBERS FOR 1900.

Amelang, William.....Ottumwa
Amsden, D. R.....Scranton
Anderson, Hans. S.....Kimballton
Brewer, J. L.....Indianola
Brown, E. E.....Onslow
Callison, J. A.....Grand View station, Des Moines
Chapin, W. E.....228 Fifth street, Des Moines
Connor, A. B.....Humboldt
Culver, O. M.....P. O. box 275, Greenfield
Dreyer, J. F.....Frankfort, Ind.
Erwin, A. T.....Ames
Filkins, C. H.....Brooklyn
Fleming, Peter.....Lyons
Fortner, J. H.....LeGrand
Graham, M. J.....Adel
Guilford, W. H.....Dubuque
Herron, Edw. W.....Dubuque
Lemon, R. L.....Mitchellville
Little, E. E.....Ames
Martin, H. E.....Mount Ayr
Michener, H. H.....West Branch
Parsons, A. E.....Creston
Scott, E. C.....Sac City
Schroeder, Henry.....Sigourney
Sexton, J.....Ames
Steinman, Christian.....Mapleton
Stuart, B.....Rural Route No. 1, Altoona
Theilen, John.....Ottumwa
Warren, C. D.....Station No. 5, Des Moines

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Watson, H. T.....Des Moines
Whittington, M. G.....Hedrick
Wilson, T. J.....Sioux City
Woodward, H. N.....Cedar Rapids

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CONSTITUTION.

ARTICLE 1. This society shall be called the Iowa State Horticultural Society, and shall have perpetual succession.

ART. 2. The object of this society shall be the promotion and encouragement of horticulture and arborculture, by the collection and dissemination of correct information concerning the cultivation of such fruits, flowers and trees, both deciduous and evergreen, as are adapted to the soil and climate of Iowa.

ART. 3. Said society shall hold its annual meeting each year for the transaction of its business at such time as may be fixed by said society, at which meeting officers shall be elected as follows: A president, vice-president, secretary, treasurer and librarian, who shall serve one year. The society shall elect one-half of a board of directors, the full board not to exceed twelve in number, who shall serve two years, except vacancies on the board may be filled for the unexpired term.

ART. 4. The secretary shall keep a full and accurate record of the proceedings of the society. He shall open and carry on a correspondence with such fruit growers, florists and horticulturists in general throughout the state as manifest an interest in the purposes of the society. He shall annually make up a report for publication, embracing such information upon fruit-growing as may come within his reach, with a full report of the business affairs of the society, and shall be allowed a reasonable compensation for his services.

ART. 5. The treasurer shall have charge of the funds and other property of the society, and dispose of them as decided by the board of officers. He shall pay out no money except upon the order of the president and countersigned by the secretary. He shall make up a true and full report of all money and other property put into his hands for the benefit of the society, with disbursements and vouchers, annually, and present the same to the secretary on or before the first day of the meeting in December, and shall be required to give bond in such sum and with such securities as the board shall direct, which bond shall be approved by the president and filed with the secretary. The depository of the funds of the society shall be selected by the executive committee, and the treasurer shall exact a personal bond, or a bond of a responsible indemnity company from such depository, to indemnify him from all loss occasioned by his deposits. Under no circumstances shall the treasurer or his bondsmen be released from liability to the society until full and complete settlement with, and payment to, the society has been made by him.

ART. 6. All accounts brought against the society shall be audited by the board.

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ART. 7. The members present of the board shall constitute a quorum for the transaction of business at any regularly called or adjourned meeting.

ART. 8. Any person may become a member of this society by the annual payment of $1, or a life member by the payment of $5. The annual members shall have the right to participate in all discussions and vote upon all questions except the election of officers. Honorary life membership shall be conferred only on those who have rendered valuable service to the society, and the manner of admission to life membership shall be as follows: A motion to confer life membership shall lie over until the following session and must receive the unanimous vote of those voting on the question. Should an objection be filed with the president prior to the time of taking the final vote, or if a negative vote, or votes, shall appear, the application shall be declared rejected.

ART. 9. Officers of this society shall be elected by the votes of life members and of those who have become members for two consecutive years last preceding such election.

ART. 10. The fiscal year shall commence and end at the December meeting of each year, and the retiring board shall settle the business of the previous year.

ART. 11. All amendments to the constitution shall be offered in writing and receive the endorsement of the society by a two-thirds vote of the members present. The amendment shall then lie over until a succeeding session of the same annual meeting, and must again receive the approval of two-thirds of the members present.

BY-LAWS.

First.—The officers of this society shall be elected on the evening of the second day of the December meeting, annually.

Second.—The officers of this society shall hold their respective offices until their successors are elected and qualified, except the term of the office of secretary, which shall terminate on the first Monday of April following, at which time he shall forward his books and papers to his successor.

Third.—The president (and in case of his absence the vice-president), secretary and treasurer shall constitute an executive committee, who shall perform any business deemed necessary for the society in the absence of the board. That the executive committee be invited to sit as consultative members of the board of directors.

Fourth.—The annual membership shall cease on the day preceding the first day of the annual meeting of the society in December.

Fifth.—No person shall be eligible to the office of president, vice-president, secretary or treasurer, who has not been a member of the society three consecutive years previous to election.

Sixth.—These by-laws may be amended at any general meeting of the society, by a vote of a two-thirds majority of members present.

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RULES.

1. Any plant that has been or may hereafter be produced by state funds shall not be eligible for premiums offered by the society on new fruits, etc.

2. Each station keeper shall follow the special line of work designated and required of him by the board of directors, but he shall not be prohibited from carrying on other experimental work if he so desires.

3. He shall properly care for all stock sent him for experimental purposes, and carefully guard all experimental work intrusted to him, and report upon the condition or value whenever requested so to do by the board of directors, or by the supervising committee.

4. Each station keeper shall be furnished with a record book in which he shall note the condition and behavior of everything received and keep a complete record of all work pertaining to the experiments he is conducting.

5. Superintendents of stations shall acquire no ownership in the stock received by them for experiment, or in any new fruit originated by them in station work. Control and ownership is reserved by the society.

6. If any superintendent of an experiment station neglect to perform the duties required of him, except for reasonable cause, his station may be discontinued by the board.

7. Superintendents of stations shall meet with the supervising committee, at Des Moines, on the evening of the first day of the annual meeting of the state society.

8. The compensation of superintendents of stations shall be $25 per annum and actual expenses while attending the annual meeting, provided all reports required shall have been furnished.

9. The experiment work of this society shall be in charge of a supervising committee of three to be elected by the board of directors, each member of this committee shall serve three years. One shall be elected at each annual meeting at which time vacancies in the committee shall be filled if any exist. The committee may annually elect its own chairman who shall keep a full record of the work and the expenditures of the committee, and shall report the same in writing to the board of directors at their annual winter meeting.

10. The supervising committee shall have authority to procure and distribute experimental stock to the several stations, to direct all experiment work, to employ experts, if necessary, and to require such reports from each station keeper as they may think best.

11. It shall be the duty of the supervising committee to make personal examination of the condition of the work at each station once in each year. They shall report their observations in their annual report.

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12. The supervising committee shall receive $1.50 per day while absent from home, visiting stations, and actual necessary traveling expenses and postage while performing the duties required of them

13. When experiment stock is sent to any superintendent of station, an itemized invoice of the same shall be sent him by mail, in order that the superintendent may make as few mistakes as possible in identifying the varieties received.

14. That hereafter the reports of the directors and other transactions of the district societies shall be condensed and prepared for publication by the secretaries of the respective societies.

15. That hereafter no paper or report shall occupy more than five pages of our annual volume and the secretary is authorized to edit all reports and papers.

16. That the four district societies shall be allowed an equal sum for their support, and for the present the appropriation of each society is fixed at two hundred dollars ($200) annually.

17. That the sum of eight hundred dollars ($800), or as much thereof as shall be needed, be appropriated for carrying on the work at the experiment stations in 1901. This sum to include expenses of experiment station keepers.

18. That the president be empowered to appoint delegates to the meetings of the state horticultural societies of the states adjoining Iowa.

19. That the reports of the society shall not be sent to county or district societies with an annual membership fee of less than $1.

20. That the time of annual meeting of the society be fixed for the second Tuesday in December.

21. That C. L. Watrous, Silas Wilson, A. L. Plummer, J. G. Berryhill and M. J. Wragg be appointed a committe on legislation.

22. That the executive committee shall be a committee on program for the ensuing year.

23. That the reports of the twelve directors of the state society be submitted to the secretary of the society on or before the first day of the annual meeting.

24. That the directors be required to report the most popular fruits in their respective districts.

25. In discussing questions, no member shall speak more than five minutes, nor more than once until all who desire to speak shall have spoken, unless by permission of the society. It is the duty of the president to enforce this rule, and it is the privilege of any member to demand its enforcement.

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PREMIUM LIST.

The state shall be divided into three fruit districts,—northern, central and southern,—as heretofore, and in each district the following premiums shall be offered:

SEEDLINGS.

Best collection of seedling apples, grown by exhibitor.....$ 5.00
Second collection of seedling apples, grown by exhibitor..... 3.50
Best plate of seedling apples, grown by exhibitor..... 3.00
Second plate of seedling apples, grown by exhibitor..... 2.00
Third plate of seedling apples, grown by exhibitor..... 1.00
Best plate any worthy variety of standard apple, kept without cold storage..... .25
Second plate any worthy variety of standard apple, kept without cold storage..... .15

Rules for judging, and score points, same as used at state fair, 1896. See vol. 31, Horticultural report, pages 456–7.

SOUTHERN DISTRICT.

STANDARD VARIETIES.

Best collection, not less than 20 nor more than 40 varieties, kept without cold storage.....$15.00
Second collection, not less than 20 nor more than 40 varieties, kept without cold storage..... 10.00
Best plate, each, of 20 most desirable winter apples..... .25
(Plate premiums shall be limited to 20 varieties in each district.)

CENTRAL DISTRICT.

Best collection, not less than 15 nor more than 30 varieties, kept without cold storage.....$15.00
Second collection, not less than 15 nor more than 30 varieties, kept without cold storage..... 10.00
Best plate, each, of 20 most desirable winter apples..... .25
(Plate premiums shall be limited to 20 varieties in each district.)

NORTHERN DISTRICT.

Best collection, not less than 10 nor more than 20 varieties, kept without cold storage.....$15.00
Second collection, not less than 10 nor more than 20 varieties, kept without cold storage..... 10.00
Best plate, each, of 20 most desirable winter apples..... .25
(Plate premiums shall be limited to 20 varieties in each district.)

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For best seedling apple grown in either district, whether by exhibitor or not, and accompanied by written statement as hereinafter provided, there may be awarded a special premium of $15, for not less than twenty scions of it, for use of the experiment stations of the society. This premium shall not be awarded unless the fruit and statement convince the committee that the variety has such promise of permanent value as to warrant its propagation for trial. The statement must show age of tree, its comparative hardiness and productiveness, its origin as far as known, the character of soil and subsoil, whether timbered or prairie land, situation as to shelter and slope, nearness to water, and its comparative elevation. The premium shall not be paid till scions are delivered in good order to superintenent of the experiment stations. No premium shall be paid on any seedling unless scions of it are furnished, if desired.

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PROCEEDINGS OF THE

Thirty-fifth Annual Meeting

OF THE

Iowa State Horticultural Society.

Held in Des Moines, Iowa,

December 11, 12, 13, 14, 1900.

TUESDAY, DECEMBER 11, 2 O'CLOCK P. M.

The society was called to order by the president, C. F. Gardner, after which the Rev. W. H. Wynn, of Ames, pronounced divine invocation.

THE PRESIDENT: The vice-president not being present, I will call on Dr. Powell to assume the chair.

DR. F. M. POWELL: The next upon the program is the address of the president, C. F. Gardner, of Osage.

PRESIDENT'S ADDRESS.

Members of the Iowa Horticultural Society:

GENTLEMEN—We have assembled here to commence the thirty-fifth meeting of this society. It is with pleasure that we meet the delegates from other organizations, in this and other states, societies that are doing all in their power to advance the interests of horticulture. We give you a cordial welcome and invite you to join with us in our discussions.

We have met here to make a record of what has been done to advance the interests of horticulture during the year 1900, and to lay plans for the future.

At the last session of this society the experiment stations were reduced to eight in number, with the central station located at Ames, Iowa. Prof. John Craig in charge. An elaborate line of work was laid out, to be carried on in the line of cross-fertilization, top-working and spraying. While this work was in progress we received notice from Prof. Craig that he had resigned his position as professor of horticulture at the college, and accepted a position in a distant state, and that this would necessitate his withdrawal

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from his station management, and as a member of the supervising committee. After a certain line of procedure, or plan of operation has been adopted and work commenced thereon, it is very embarrassing to this society to have a change made in the conductor of the central station in which we, as a society, have absolutely no voice whatever. We have no way, that I know of, even to express our opinion on the subject. I believe we should place ourselves in such a position as to enable us to elect our own officers. With this object in view I recommend that Rule ninth be changed to read as follows:

"Rule ninth. A committee to be known as the supervising committee, consisting of three members, shall be elected by the board of directors, of which committee one shall be chairman and hold his office for three years. The two other members shall be elected, one for two years, and one for one year, and thereafter one member shall be elected annually to serve a term of three years. The chairman of this committee shall report all its doings, in writing, to the board of directors, each year, on or before the evening of the first day of the annual winter meeting."

I recommend that Rule eleventh be changed to read as follows:

"Rule eleventh. It shall be the duty of the supervising committee to inform themselves, each year, by personal inspection, of the work being done at each of the stations."

I believe it would greatly facilitate the interests of our society, advance horticultural knowledge, and increase our membership, to have a summer meeting, to be held during our state fair. To co-operate with the State Agricultural Society in getting up an exhibit of fruits, plants and flowers that would be a credit to all parties concerned and not cost this society but very little money. We could appropriate a reasonable amount to be used in paying premiums on new varieties of seedlings, not before exhibited. A good premium in this way will bring to public notice fruits that otherwise might remain long unknown. I therefore recommend that such action be taken.

Experimental work is the only line of action for the development of horticulture. Look where you will, we see every reason for encouraging a broad range of enterprise in this direction. Every farmer can plant and mature a few seedlings as well as care for a few new varieties procured from some one in whom he has confidence. This would increase the chances for securing new and desirable fruits adapted to their respected localities.

We know that Iowa has in stock rich resources for the future that if rightly handled would cause a revolution in fruit growing. It is the aim and object of this society to so develop these resources by cross-fertilization and the judicious selection of varieties that we may be able to say that we have a group of fruits originating here that are all our own.

"As the years pass by with their seed-time and harvest, we are reminded by the decaying plant and ripened fruit, that nature has decreed that only the vegetable kingdom is allotted a period of growth, maturity and decay, but man also." Since our last meeting we are called to record the deaths of Matt Parrott, of Waterloo; L. Tatum, of Springdale, and J. H. Gear, of Burlington. We can but submit, knowing that the great laws of nature are inevitable, shaping their course and events as time progresses.

This session will bring to a close my third term as president of this society. In retiring from the duties of this office, I wish to thank you for the

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honor you have unanimously conferred upon me for three consecutive years. I have tried to do my duty, if I have failed, it was through lack of knowledge. I am under obligation to every member of this society for courtesies extended. During these years, harmony has attended our efforts, may it be so in future, and I hope to remain an active member with you for many years, if my life is spared. My desire is that this society may continue to prosper and carry on to its fullest development the line of work already established, regarding whose merits you are all happily agreed upon.

THE PRESIDENT: The next upon the program is the report of the secretary, Wesley Greene, of Davenport.

REPORT OF SECRETARY AND LIBRARIAN.

Each year brings some new experience which characterizes it from all others. A year ago our thoughts were engaged with the problem presented by the unusual climatic conditions which proved so destructive to the roots of trees, commonly known as "root killing." The lesson was an expensive one and hard to learn, but it will not soon be forgotten, and in the future we will give more attention, in our study of plant life, toward strengthening this part of the plant by avoiding combinations which have proven so disasterous to our orchards and fruit plantations.

This year the fruit crop has not been a large one but prices were satisfactory; plants and trees made a good growth, and, on the whole, the season has been one of encouragement. No killing frosts occurred, however, until late in the fall so that many of the trees still retain much of their foliage. Some fear has been expressed as to the result, but we see no occasion for alarm so long as the weather conditions remain unchanged.

Last winter under the pressing demand by other departments for more space in the capitol building, the legislature thought it best to make a new assignment of rooms and moved this society from the apartment it occupied in the basement to its present location. You were apprised of the circumstances connected with this change at the time it occurred and we need not refer to them now. The change caused some delay in the work of improving the museum, but this will be temporary only and will soon be remedied. Though the space is somewhat limited now it need not deter us from continuing the work already commenced.

During the year we have purchased exhibition jars and gathered a few specimens of fruit which we are testing in preservative liquids. We hope to make this a more prominent feature in the museum work, and especially desire to make as complete a collection of American plums as possible. The work of developing a race of plums for the Northwest from the best of our native sorts will occupy the attention of hybridists for the next century and will be watched with interest by all thoughtful fruitmen.

We have secured a number of specimens of diseased foliage for the museum, which we hope will serve as a nucleus around which will be gathered a large number of these fungus diseases that are so destructive to plant life. A collection of this character helps to familiarize people who visit it with the appearance and habit of these different fungus growths and helps

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them to better understand the methods of treatment when their plants are attack by them.

We acknowledge a debt of gratitude to Prof. L. H. Pammel for his very generous donation of specimens of our native flora. This will give the society a good start towards securing a much needed herbarium. We have ordered a new cabinet for this collection and when it is in place there will be more room to display other specimens.

Since the last meeting we have placed over 1,600 volumes of the Transactions of the society in more than 300 libraries of the public schools of the state. Most of this distribution has been without expense to the society, except in a few large shipments sent by freight, when boxes and transportation charges to freight houses were paid by the society. We recommend that this distribution be continued until all the surplus volumes are disposed of.

The number of volumes in the library has been increased by purchase and through exchange. During the year we have sent copies of the report to all the state horticultural societies and experiment stations in the country and have received their reports and bulletins in return, and hope in this way to get into closer touch with the work that is being done to advance horticulture throughout North America.

The work done in this office has been a continuation of that commenced last year; the gathering of information by circular letters from members and reporting the result from the replies received. Interest seems to be increasing in this work. At first only thirty-five replies came from a membership of 460, but since then the number has increased more than fourfold, so that now we have over 150 active workers along this line of research. If this work is continued it should be put on a more stable basis and extended so as to include a larger field of inquiry; as plants under glass, on lawns, in parks and cemeteries, vegetable and market gardening, small fruit, tree fruits and timber culture. Under these sub-divisions the information sought could be more quickly obtained and with less effort, and sent direct to those interested along that line of inquiry. Placed on such a basis the society would become the central station, and each member, willing to co-operate, through reports and exchange, would be a station keeper, and the annual meeting of the society a convocation of station workers, in which each subdivision could have one or more sessions assigned to it for those interested along that line of work and they would know definitely what session to attend if they could not be present at all of them.

FINANCIAL STATEMENT.

CREDITS.

By cash on hand from last report	$ 58.18
By contingent fund	150.00
By special appropriation	250.00
By membership fees	57.00
By reports sold	1.00
Total	$516.18

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DISBURSEMENTS.

To report on Russian Nom. Commission	$ 3.75	
To repairs on typewriter	16.50	
To C. M. King, artist	26.00	
To Star Engraving Co.	41.70	
To express companies	28.05	
To books for library	41.20	
To 8¼ dozen exhibition jars	66.25	
To repair on cabinet	.75	
To programs for summer meeting	8.00	
To programs for winter meeting	11.00	
To specimens of diseased foliage	15.75	
To paper covers for specimens for herbarium	5.00	
To White Line Trans. Co	2.60	
To 20 boxes	2.25	
To 100 maps	35.00	
To treasurers' voucher	48.00	
Total	$351.80	
Cash to balance	164.38	
Total		$516.18

THE. PRESIDENT: Next we will listen to the report of the treasurer, W. M. Bomberger, of Harlan.

REPORT OF TREASURER.

DISBURSEMENTS.

NUMBER WARRANT.		AMOUNT.
785	W. A. Burnap, delegate to South Dakota	$ 19.27
786	M. J. Wragg, expenses to winter meeting and station fee	34.00
787	Eugene Secor, expenses as delegate to Minnesota, and to winter meeting	23.50
788	J. P. Jackson, station fee and expenses to winter meeting	43.80
789	B. Shontz, expenses as director to winter meeting	23.34
790	John M. Chaffee, premiums on fruit	18.50
791	N. K. Fluke, directors' expenses to winter meeting	20.25
792	Prof. J. Craig, expenses	32.72
793	Abner Branson, station fee, premiums and expenses to winter meeting	62.25
794	B F Ferris, expenses to winter meeting	16.47
795	C L Watrous, station fee and expenses to winter meeting	33.50
796	A. L. Plummer, expenses as director	5.72
797	W. O. Willard, expenses as director to winter meeting	10.38
798	Elmer Reeves, expenses as director to winter meeting	16.30
799	C F. Gardner, expenses to meeting, blank books and postage account	30.45
800	C. G. Patten, station fee and expenses as delegate American Pomological Society,	77.20
801	B Stuart, premiums on fruit	16.25
802	R. P Speer, station fee	25.00
803	Wesley Greene, salary to January 13, 1900	133.32
804	"Kirkwood" board for delegates	13.00
805	W. M. Bomberger, expenses to winter meeting	18.55
806	W. M. Bomberger, Treasurer's salary 1899	100.00
807	W. M. Bomberger, postage and stationery supplies	8.05
808	P. F. Kinne, station fee	25.00
809	Wesley Greene, contingent fund	100.00
810	Wesley Greene, contingent fund	50.00
811	Wesley Greene, special fund for office work	200.00
812	Wesley Greene, instal ment on contingent fund	50.00
813	Cancelled.	

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NUMBER WARRANT.		AMOUNT.
814	Wesley Greene, salary to April 13, 1900	200.00
815	Dr. F. M. Powell, for 1,400 copies Nature Study Outlines	25.00
816	Frank Horsfoll, gathering pollen	10.00
817	Jacob Blumer, plant breeding by Prof. J. Craig	8.00
818	Henry Palmer, plant breeding by J. Craig	2.00
819	N. K. Fluke, plant breeding and expenses	38.89
820	C. L. Watrous, plants for stations by J. Craig	14.13
821	Paul H. Brown, plant breeding by J. Craig	13.93
822	Edgar C. Myers, plant breeding by J. Craig	9.96
823	Charles Rhinehart, plant breeding by J. Craig	22.59
824	C. W. Warburton, plant breeding by J Craig	21.00
825	T. C. Thurlow, stock for stations by J. Craig	1.50
826	Gould Manufacturing Company, supplies for stations by J. Craig	2.60
827	Hoopes Bros. & Thomas, stock for stations by J. Craig	7.00
828	Albertson & Hobbs, stock for stations by J. Craig	4.65
829	M. J. Graham, stock for stations	5.75
830	Ridgeway & Kaiser, stock for stations	5.00
831	L. M. Bosworth, supplies for stations by J. Craig	2.55
832	Prof. J. Craig, expenses	28.87
833	J. P. Jackson, paid for blue vitrol	5.00
834	Charles F. Gardner, for spraying mixtures	8.65
835	Prof. J. Craig, for horticultural department, Iowa State College, freights	12.53
836	Prof. J. Craig, telegrams and sacks	4.61
837	E. C. Meyers, work, expense on plant breeding	4.37
838	Prof. J Craig for horticultural department Iowa State College, labor, tools, sacks.	$ 16.80
839	Wesley Greene, salary to August 13, 1900	266.67
840	B. Shontz, expenses as director to summer meeting	11.90
841	C. G. Blodgett, expense as director to summer meeting	5.50
842	W. O. Willard, expenses as director to summer meeting 1900	4.90
843	A. Branson, expenses as director to summer meeting 1900	5.45
844	Prof. J. Craig, expenses in cross breeding	19.14
845	J P. Jackson, expenses as director to summer meeting	10.65
846	R. P. Speer, expenses as director to summer meeting	7.40
847	C. F. Gardner, expenses to summer meeting	14.50
848	P. F. Kinne, expenses as director to summer meeting	4.26
849	W. M. Bomberger, expenses to summer meeting	9.75
850	Wesley Greene, salary to October 13th	133.33
851	Warrant lost and unpaid	
852	Wesley Greene, premiums paid on native plums at fair	20.00
853	Wesley Greene, expenses as delegate to Illinois, December 1899	24.24
854	E. E. Little, for collecting crossed fruits, for canvas and mosquito bar	8.97
855	Wesley Greene, salary to November 13th	66.66
856	Blank not issued	
857	Frank O. Harrington, Treasurer Southeastern society	150.00
858	A. Ivins Treasurer Northeastern society	150.00
859	B. Shontz, Treasurer Northwestern society	150.00
860	I. M. Needles, Treasurer Southwestern society	150.00
861	Elmer Reeves, for fruit and labor for Paris exposition	5.75

TREASURER'S BALANCE SHEET.

W. M. BOMBERGER, TREASURER IOWA STATE HORTICULTURAL SOCIETY.

To balance December settlement 1899	$ 765.61
January 1st, state auditor's warrant No. 12981	600.00
June 16th, state auditors warrant	800.00
November 17th, state auditor's warrant No. 4256	1,275.00
Membership fees to date of settlement	92.00
Total	$3,532.61
Credit by warrants paid	2,901.27
Balance due the society	$ 631.34

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THE PRESIDENT: I will now announce the following committees:

Committee on the President's Address.—C. L. Watrous, Dr. F. M. Powell, Eugene Secor.

Committee on the Secretary's Report.—Silas Wilson, N. K. Fluke, F. E. Pease.

Committee on the Treasurer's Report.—Elmer Reeves, M. J. Wragg, M. E. Hinkley.

Committee on Premiums.—W. G. Gano, of Missouri; A. J. Edwards, of Wisconsin, and Maj. Frank Holsinger, of Kansas.

A MEMBER: I move you, Mr. President, that all the delegates from sister states be made honorary members of this society. The motion was unanimously carried.

THE PRESIDENT: We would like to hear a few words from the delegates. We will hear from Mr. Edwards, of Wisconsin.

MR. EDWARDS; I am very glad to be with you to-day and I am very thankful for your cordial reception, and hope that we will get a great deal of good out of this meeting.

MR. PRESIDENT: I will call upon Mr. Gano, of Missouri.

MR. GANO: It is certainly a pleasure for me to meet with you upon this occasion. It has been the height of my ambition for years to meet with the Iowa Horticulture Society. This is the first time I have had an opportunity, and certainly look forward to a very pleasant and interesting meeting. I am among you to learn and hope the meeting will be profitable. I feel that the older we get, the less we know. I do not think I have anything to say now that would be interesting, but have brought with me a delegate from Kansas whom I delegate to do the talking, and in this connection you might call on Major Holsinger. Gentlemen, I thank you.

THE PRESIDENT: I think it is a good time to call on Major Holsinger, of Kansas, now.

MAJOR HOLSINGER: It affords me great pleasure to be with you on this occasion. Did it not, I would not be here, I assure you. Last week, in company with brother Gano, we spent the week with the Missouri brethren way down in the southeastern part of the state, and we have been stirred up a little along these lines. In fact these meetings should be for that purpose, to stimulate us along the lines of horticulture, and, as has been suggested, to pick up such information as may be of use to us in our efforts to succeed in fruit growing. I do not know just how to direct my thoughts at this time to interest so intelligent a body

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of horticulturalists as are here. I take it that you are all men that have been working along these lines and have seen something of the successes, as well as the failures, attending horticulture.

The Secretary's report indicates that you, like us, have been injured severely by the recent winter of 1897–8, when the thermometer fell so low as to jeopardise the fruit interests of a large section of the country. In fact this condition has been so widely disseminated that the Ozarks were not only in the belt or zone that was so badly injured, but I think it was injured more severely than you here. Large peach orchards, some of them extensive, twenty thousand or more trees, were entirely blasted and killed by that terrible freeze. I am a member of the Kansas and also Missouri society, and all kindred societies that I can come in touch with, and I believe that fifty per cent of the fruit throughout the section indicated has been destroyed. Possibly worse than destroyed. Mr. Gano and I have been the promoters of the extensive orchard in southern Missouri, known as the largest orchard in the world. We claim to have twenty eight hundred acres in fruit, or nearly so, and I want to say that while we expected to make that orchard a great success financially, it has been a failure throughout. The whole project has been thwarted, either by providence, or for some other reason. The orchard is in such condition at this time that it is almost entirely useless.

I want to say that the last meeting was something of a surprise. While we had a horticultural meeting; talked fruit growing,—raspberries, strawberries, cherries, etc., we heard very little along these lines. That south Missouri has been visited by things entirely new that are threatening to devastate that great fruit region. I take it that the great belt of the Ozarks, known as that of the big red apple, is a misnomer. Nearly the entire meeting there was spent in writing and talking of root-rot, black rot, and the like. Now there is another disease that is worse than all the other ills disseminated. Goose Eye is what it is locally called, and it threatens to be worse than all the other injuries combined. I have understood there was a local professor who had discovered it was an insect that stung the apple and after a long period the egg would hatch and the insect ramify under the skin of the apple and when the insect becomes an adult it passes out; the skin breaks away and forms a very big hole, to the natives indicating a goose's eye; hence, the name Goose Eye. In that native orchard I think he had sold some

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$6,000 worth of fruit. I talked to Professor Steadman about it and he said it was a new one on him. It certainly is a new thing. We have no knowledge of it. So we find that our ills are continual. No sooner do we master one thing that is detrimental to our interests, than something else comes up, and I claim, instead of continually going after new things, if we would follow out the old, plain beaten track, we might still have some good fruit. I remember a Dutch friend of mine came to me and said: I am crazy; I don't know anything; but, he says, when I see an excrement coming out from the base of a tree, I cut around there and then take a wire and stir around in there and if I see greasy matter on the end of the wire, I know I have killed a worm. I sometimes think he wasn't as crazy as a good many people talking along those lines, as we are not certain they are succeeding. But, gentlemen, I am taking more time than I should and will give way to the proceedings of this society.

THE PRESIDENT: I think that every member of the society will bear me out in saying that we would like to hear from our old friend, Mr. Lathrop, who is with us. We are glad to have him with us again and we want to hear a few words from him.

MR. LATHROP: I have not had time, gentlemen, to select my text.

THE PRESIDENT: You will get your text all right while you are taking your coat off.

MR. LATHROP: Well, it is somewhere between the leaves of the horticultural bible, which I have been studying about fifty years. I think sometimes the more I study it the less I know. At the same time I find out a great many things, but I do not know as I have much to say to interest the members here.

I spent last winter in South Dakota and I met with their State Horticultural Society at Parker. It was their eleventh annual session. Now there wasn't an apple shown there, not an apple. They have not yet found winter apples they can raise. They raise the Duchess, Wealthy, Whitney and some others I might name. I have seen the Alexander grow there. They have got to go to work there and make some apples for themselves.

The Secretary of the society has invited me to write a paper for them. The paper that I will write, will be to tell them how. It is my theory; it is not my experience. We know now that they can raise the Duchess there. We know they can raise the Wealthy. We also know they can raise the Whitney. Now if they will step over into Minnesota, they will find some longer

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keeping apples. That is the Malinda. I am going to tell these men up there in that colder and dryer climate and more windy climate, to take that Duchess, the Wealthy and the Whitney and top-work half of those trees with the Malinda and then when they get some seeds, no matter from what tree, let every apple grower plant them, I will tell them, and then all of South Dakota become an experiment station. Let their homes become an experiment station. Of course, they have good soil there. They have more sunshine in their summer days; their soil is equally fertile. When they plant these seeds they will get some trees. They do not know what fruit they will bear. They will have them where they can be fertilized with other trees. Let them plant these seeds and grow some trees. They may get something that will not be very excellent fruit and not worth propagating. There is one thing certain, they will get a hardy tree. Then if they get a good apple, when they get one, they will have an orchard they can top-work on If they will get to work and do that, they will have some home apples.

Now, while I am here, I will undertake to say that we members of the State Horticultural Society have neglected just that kind of work for the last twenty-five or thirty years. Where is there a seedling apple that has been raised in Iowa, that is recommended by anyone of the five societies we have got here in the state?

A MEMBER: Pattens' Greening.

ANSWER: That has just come in. I am glad you mention it.

A MEMBER: The Iowa Blush.

ANSWER: No, the Iowa Blush is an imported apple. I know that. We found it in the eastern part of the state. Kauffman got it there. We rechristened it the Iowa Blush.

A MEMBER: We got it in the name of Sweet Bellflower of Ohio.

A MEMBER: Do you know the origin of it?

ANSWER: It is generally supposed it originated near Iowa City. I think Jerome got it from Ohio.

(Mr. Reeves exhibits a Malinda apple.)

MR. LATHROP: Here is the first time I have ever had an introduction to the Malinda apple. I will undertake to say that n 1855-6, I was here, and we were worse mourners than since the last cold snaps. Our orchards were nearly all wiped out. We began to say that we could not raise apples in Iowa. That used to be almost as much the standard song of the horticulturist as

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the doxology is in churches. There was hardly a sermon on fruit preached but that was the doxology. But we went to work and finally raised apples here again. I have an idea if you will cross that Malinda with the Duchess or Wealthy you will have a winter apple north. But then they have got to make them nearly all there.

I will not detain you longer. I am glad to meet with you once again. I think I was at the first meeting that this society ever held.

MR. C. L. WATROUS: I want to relate one instance in regard to the Malinda here. When the fruit show was made at the World's Fair in Chicago, Iowa sent a few of the Malinda apples from the northern part of the state and they were there on the table. One day in my absence, the committee of the wise men came to look over the tables to see what the fruits were and whether they were properly named. And they said this was wrong, that it was a White Winter Pearmain. They held a coroner's inquest over it and they said it was unquestionably a White Winter Pearmain. They corrected the mistake with a great deal of dignity. When they got to the next table I came in and inquired who had been ehanging the lables. They said, they had,— These dignified gentlemen. I went for them,— I knew some of them by sight,— and told them they had to go back and straighten that up. I told them it was not a White Winter Pearmain, that it grew in Iowa and was properly named; that it was all right and they were all wrong. The upshot was that they reversed themselves, like the supreme court of the United States on the greenback question. I concluded, that an apple that can go into such company as that and pass itself off for White Winter Pearimain, wasn't to be sneezed at.

THE PRESIDENT: Mr. Patten, did you bring down that specimen you had? Let us hear from you.

MR. C. G. PATTEN: I did not. I will say that it was the finest specimen I ever saw. I would like to say, it was three times as large as this apple I hold in my hand; but it was certainly as large again. It is only an enlarged form of this apple and more beautiful. The gentleman had two of them and very kindly gave me one. I asked him where it was grown. He said it was a three year old graft set in a bearing tree that produced fifty-nine apples.

The tree, as Mr. Lathrop has said, will undoubtedly be the parent of long keeping apples in that northern country. It is

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not the only one by any means. As he also said, we differed upon doing this work twenty-five years ago all over this country, as many of the older members of this society will well remember. Had my advice been followed, that I used to lay down with such emphasis in the *Iowa Homestead* during Governor Gue's time with reference to long keeping apples, we might have had better results. A few years ago, I was in the western portion of the state, down below Sioux Falls, looking at their apples and noticing the climate and I made up my mind that the Janett was one of the apples to work into new varieties. One of the elements we most need in this country, to work with, is a variety that will hang well to the tree, especially is that true when you go into the Dakotas.

I am very glad to see this subject occupying so much attention all over this Mississippi valley. In fact the improving and developing of, not only the apple, but all kinds of fruits is really taking possession of the whole United States. I well remember when I used to go up to the Minnesota Horticultural Society, and they had a little cluster of apples that could be placed upon your table; I also attended their state fair and they had but a very small group of apples to represent the state. That is perhaps now fifteen years ago. But now when you attend their state fair and their meetings, they are actually outstripping Iowa in the exhibit they make. I felt last summer when I attended that fair, that I wished we had not lost so much of the enthusiasm that we used to have in this state. I can say to you, gentlemen, that unless the Horticultural Society picks up and gets a livelier step, they will be far distanced by the Minnesota State Society.

THE PRESIDENT: We have now completed the program for this afternoon and at the present time this is the "free for all." The balance of the time you can use as you see fit.

MR. SILAS WILSON: I want to just say a word about this apple. I want to say this is rather a dull colored specimen for a Malinda. It usually is a brighter color. I think I have a few I will put on the table this afternoon. The few that I have with me were kept in a barrel in a warm cellar under the house. You can see they are in good shape now and will keep all winter.

A MEMBER: State the quality of the apple.

ANSWER: It is almost sweet. It is an excellent cooking apple. I came across a family in Minnesota who raised Malindas for family use. In cooking they quartered, cored and cooked them with plenty of sugar, without stirring. It passes off for an

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excellent sweet apple and, of course, they can use it from now until fruit comes next summer.

I wish to say that Mr. Patten was rather too modest in speaking of seedlings. He has a number of seedlings of well known varieties that can but result in much good.

A MEMBER: What is the University apple, do you know anything about it?

ANSWER: The original tree is almost perfect and thrifty. I can not tell much about the fruit, because I do not remember of seeing it. I will tell you, he has so many seedlings and by the time you have spent one, two, three or four days looking at them, you do not know what you have seen. You go home like you did from the world's fair. I will say in regard to these Malindas at the world's fair—I have a suspicion that it was not a White Winter Pearmain and wasn't a Malinda, but a seedling which I have been growing. The tree has not done the best in the orchard. I have not propagated it as I should, because I thought the Malinda apple was a better tree. The fruit is more acid than the Malinda; is about the same size and style of fruit, but the tree is of a more crabby appearance than the Malinda.

THE PRESIDENT: Captain Watrous, are you ready to make a report as delegate to Minnesota?

C. L. WATROUS: I have not my notes here, but I am just as ready to do it now as I ever will be, if our president and Mr. Patten will help out. I hardly know what things to speak of first, but the one thing that occurred to me—the same as Mr. Lathrop has spoken of—they seem to be further ahead than we are along these lines of independent investigation. Every question that came up there seemed to be treated with the utmost freedom and fairness. Every man was encouraged to have his say, whatever he thought, whether it would be orthodox or heterodox. Their society, in that way, has escaped certain dry rot which has afflicted this society, as we all know. I speak of it by way of contrast. We have been hindered here from following opposite lines of investigation and free speech, because it was stated it would antagonize certain men and interests. Up there they seem to be absolutely free. If any man had an idea about anything, they seemed to be glad to hear what he had to say; if it was good, they agreed to it; if not, it was dissented from firmly and kindly, and in that way it was a free put in for everybody and I believe they are further along than we are; but I do not think they have any better men there than we have here. I think that

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this society in the next three or four years will do a good deal more work in new lines of interesting experiments, endeavoring to produce new fruits, than it has done in the last fifteen years.

There was one thing they did that I wish might be done here I believe it would be a great advantage. The first evening of the society there was no meeting; but at the hotel where they had headquarters, there was a free party; they divided off into groups and finally went into a room and every man had his say freely; and it is my experience, and I believe it is of every man here, that a good many men will talk freely, if they do not think they are making a speech; but if they think they are making a speech in an open meeting, they are just about as good as ostracized. And in that way, if we should so arrange our program, that we would not have more than one evening meeting during our session, we would get much farther ahead.

I noticed there that they had arrangements with certain other state organizations; they had the bee-keepers meeting in connection, and the state forestry association was in session. This society took an active and very useful interest in forestry. It is just as necessary in a great state of grass like ours. During the last fifteen years while we have been talking Russians the matter of forestry has been substantially dropped. I think that is one of the things that we ought to take up again. I think we ought to take a leaf out of their book in that regard. Another thing they had, which seemed to me of use to us, was a ladies auxiliary society, and they gave up to them one whole afternoon. They had arranged a program. They had papers on the ornamentation of school grounds, improvement of towns and cities. Maybe we could not do that here; maybe we could if we tried. I had some notes about several other things that I wanted to speak about, but as there are two others who were there, I have no doubt they can tell of the other things that are not spoken of now.

MR. LATHROP: Capt. Watrous spoke of this forestry subject. Some years ago this society used to publish what they called a *Forestry Annual.* It was put out every year at quite a little expense of printing. They finally concluded to revise it, or have it revised and not have it printed every year, and call it the *Forestry Manual.* They had ten thousand copies printed. I was appointed to revise it. I suppose there are about five thousand copies up in my attic on my farm that have been lying there for years. I have tried to have the secretary or some officer take

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them off my hands; they have not taken them. I promised South Dakota should have a few of them this winter and I will send them up there. The balance perhaps will stay there until the old house burns down, unless you make some arrangement to have them removed.

C. G. PATTEN: I will add a word to what was said and what I said before. I said they were making a remarkable display for a northern state, as they certainly are in the line of fruits. I do not wish to be understood as saying that the Minnesota Horticultural Society, or the horticultural society of any other state, is in advance of the Iowa society, along the lines of development in which we are now working. I think it is a well known fact that the Iowa Horticultural Society began its work in advance of any other organization in the United States. We had experiment stations five years in advance, I think, of any other state in the Union. We began this work very enthusiastically, at least a few of us did. In the scientific work and the selection of apples, no state compares with Iowa. It is true they have multitudes of seedings up in that state, but so far they have not developed anything very remarkable. There may come out of the plantings of Mr. Gideon something else that will be extremely valuable for all of that northern section.

While this Malinda apple is under discussion, and it has been remarked I had seedlings of that variety, it is true, I have quite a number. This variety produces seedlings that are better and hardier and more vigorous, and it seems to be a variety that is easily stamped, even to the color of the fruit. So I regard it as one of the most beautiful varieties we have in the whole northwest.

I want to say something further in commendation of the Minnesota people. The state has been very liberal with them in building a hall especially adapted to horticulture, and yet the people of Minnesota are not at all satisfied; they are going to ask for a larger one. If we compared our hall with that of Minnesota, there is no man in Iowa that loves his state, but what would be willing to go to work and do something, that he possibly could, to maintain a higher standing for our state; not only in the size of our hall, but in the beauty of the hall; and when it comes to laying out fruits and the decorations of the hall, we are entirely surpassed. It would make an Iowa man almost ashamed that he lived in Iowa. I believe no better thing could be done than to have the president and secretaay of our society, and the presi-

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dent and secretary of the Agricultural society for that matter, to go to that society and visit them and see what they are doing along these lines, It might stimulate us to do something better and more worthy to curselves than we are doing.

MAJOR HOLSINGER: I would like to say a word in regard to the apple. Of course, we are living in different latitudes. We have with us Mr. Gano. He is the promoter and propagator of the best apple that has ever been introduced. You will find some specimens of the apple in the hall below. We also have in southern Missouri a new apple that bids fair to become noted. It has some of the characteristics of the Ben Davis. There are some samples of it below.

A MEMBER: What is your apple named?

ANSWER: The Ingram. I think in flavor and bearing quality it is difficult to excel. It has all the marks of the Janet, except a higher color, a much better apple and a late keeper. In cold storage it stands it better than any apple we have found. We also have on the table below some other seedlings. I have a little seedling myself that I brought here. It is possibly one of the oldest trees in Kansas. I came in possession of the apples some thirty years ago. The tree is there now. I thought it was not worth trying to throw it upon the market, and for quality I think it is second to none at this time of the year. I simply picked this up because Mr. Gano suggested to bring it.

In regard to horticultural societies, I want to add a word as to my observation. Some fifteen or sixteen years ago, the Missouri society had no existence. It was a political machine. Whenever politics enter these societies, it is going to be their death blow. We have had the Kansas and the Missouri Valley Horticultural Society. I was present at the organization some thirty-four years ago. That society has been alive all these years. I do not believe we have missed a half dozen meetings all that time. We are a society of gentlemen that love one another; we always get together and have a love feast when we do. We have taken possession, you might say, of the two state societies. The Missouri State Society you might say is simply a part of the Missouri Valley Society. Mr Gano and myself and three other members of the Missouri Valley Society went to Columbia some fifteen or sixteen years ago, to the State Horticultural Society and we attempted to exhibit apples from our society. When we arrived there were eight delegates in that convention; five were members of the Missouri Valley Society. As a consequence we had the

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balance of power, and when we went back home we carried with us the President, Secretary and Treasurer. From that time the Missouri Valley Society has been onward and upward until today Missouri stands preeminent, having taken not less than thirteen premiums at Paris at an expenditure of about three hundred dollars. Under the efficiency of the Secretary, who has succeeded in making the finest selection and contribution, we have been enabled to capture one hundred and thirty premiums. In Kansas, of which I happen to be Treasurer, I will say that with an expenditure of less than fifty dollars—because I paid the bills—we have taken two first premiums.

We have made a selection of some seventy bushels of choice fruit. It does not cost but a trifle. Considerably of the fifty dollars is now involved in these seventy bushels. Our Secretary has a contribution in cold storage. The Missourians have two hundred bushels. They made a fine show of fruit at Farmington. This we brought is only the debris. They are reserving the other specimens and will have over two hundred bushels to show at the exposition at Buffalo. What will be the result? She will come out again just as she has in the past.

When the Missouri Valley took charge of that Missouri society, removing politics from it, elected officers who were efficient, it advanced until it outstripped, I will say any other state in the Union—I wont say New York. I am a Kansas man. I think I can look dispassionately upon what Missouri is doing, having no interest there except that of association.

C. L. WATROUS: I wish Major Holsinger would tell us something about the Winesap up here. There has come up here a Stayman Winesap.

ANSWER: I cannot give you any information. I have never planted them. Mr. Gano knows all about it. He knows more varieties of fruit and can tell more about the apple orchard than any man we have in the two states, if he wasn't quite so modest.

MR. GANO: I know there is a variety that has assumed some popularity. I have never thoroughly tested it to know just what difference there is in the types. I have seen the trees in the nursery; they were labeled Winesap. I never could see any difference between the two vareities from the appearances. In fact, I never seen any difference in the two fruits. I think Dr. Staymen, of Leavenworth, originated it.

A MEMBER: Is there any doubt about it being a seedling?

ANSWER: Well, of course, the old Doctor has been rather an

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enthusiast on seedlings. We never really doubted his assertions. I don't know as it has ever been investigated. He pronounced it Staymen Winesap. The nursery has it too; I never seen any difference, although I never tested the Staymen Winesap myself.

In regard to this Ingram apple — if that tree is hardy enough with you I believe we have something to say. The fruit is much better and I think there is nothing much better than our Ingram apples. In fact all our cold storage men, they are just crazy for the Ingram. I receive every fall letter after letter asking where they can get the Ingram apples. In cold storage, in the last three years, as it has come out of cold storage it holds its bright color; in fact it looks like it improved in cold storage, while the Janett and other colored varieties will fade out.

A MEMBER: Do you know anything about what is called the Senator?

ANSWER: I have never seen the apple. Prof. Stevenson, of the experimental station, exhibited a year ago the Senator. I have seen the Mammoth Black. It resembles somewhat the Winesap. The tree is a much better grower. It has a better root system. We have planted pretty extensively of the Mammoth Black instead of the Winesap. There have been some doubts or fears of it; I don't know that the apple is quite as popular as a few years ago.

A MEMBER: Is the Ingram a better size than the Janet?

ANWER: Yes, sir; where properly thinned out they are very uniform in size, but if left to grow until it overbears it becomes small.

A MEMBER: Is it not true that if the Janet is trimmed the apple will increase in size?

ANSWER: Certainly it will in size. The Ingram is a much better color than the Janet.

A MEMBER: Hasn't the question often been raised as to the identity of the Gano and Ben Davis.

ANSWER: Yes, sir; very frequently. The Gano has been propagated as the Ben Davis and has been sold as the Ben Davis. I know of my own knowledge at first there were a great many Ben Davis sold as Gano.

C. G. PATTEN: There is scarcely any difference in it; if any, the Gano has a darker foliage. There is but little difference except in the color; the habits are identical; sometimes we thought we could see a little more silvery color. I frequently mixed the two trees together and got some persons that didn't

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know the difference to pick them out, they couldn't do it. So far as the quality of the apple is concerned, there is little difference, the only difference is in the color.

A MEMBER: Does not the Gano color a little lower than the Ben Davis?

ANSWER: Yes, sir; it is a more dark red color, while the Ben Davis is striped.

A MEMBER: What advantage have the Gano over the Ben Davis?

ANSWER: Nothing, unless it is its color.

MR. LATHROP: Is not the New York Pippin a synonym of the Ben Davis?

MR. GANO: Yes; when that tree was found it was an old bearing tree. The history of the old orchard was this: There was an old Kentucky gentleman that came to Missouri when this Platt purchase was open for settlement. He brought seeds from Kentucky and planted a seedling orchard in Cooper county. Then when this Platt purchase was open for settlement, he came to Platt county with his seedling orchard. In those days it did't require to be anything only just fruit. We could grow apples of ordinary size and sell them. After he planted this seedling orchard he planted a few trees representing a New York nursery. He bought the Ben Davis and New York Pippin and when they came into bearing they showed no profitable results. He would graft these trees to the New York Pippin and numbers of trees were sawed off, just the trunk being sawed off. Where they were of any size he transferred the tree by sawing the limbs off. In collecting our fruits for the fairs, years after that, we frequently went to this orchard to get our exhibits for the collection.

It was in the winter of 1873-74 that I found this variety of trees. They showed no resemblance of ever having been grafted. This tree showed none. Just looked like the Ben Davis trees that this gentleman bought in New York and always supposed they were until I was made to believe it had not originated in the East. It went on until 1885, I believe, before the society named it. Then when the society chose to call it by the name of Gano, we found it bearing in other orchards that had been cut from this orchard there in '69. They supposed then it was a spur of the Ben Davis.

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TUESDAY EVENING SESSION.—7:30 P. M.

Meeting called to order by the president, who introduced to the society Mr. Warren of Des Moines. Mr. Warren exhibited to the members of the society a box devised for berry picking and gave a full description of the same.

The president appointed the following committee on resolutions:

W. A. Burnap, C. G. Patten and A. F. Collman.

THE PRESIDENT: We will now listen to the report of the directors of the various districts.

REPORT OF DIRECTOR OF THE FIRST DISTRICT.

BY C. G. BLODGETT, MT. PLEASANT.

The prospects for a good yield of fruit in my district were only partially fulfilled. With a comparatively mild winter, and a very abundant bloom, it seemed that there might be a fine crop of fruit gathered, but causes for disappointment gathered as the season advanced. The late summer and fall of 1899 were quite dry with but little rain and less snow in winter, this brought us into spring with a scant supply of moisture for the tree roots. Small fruits fared much better as there were occasionly rains to wet the surface, but not till past the middle of September did we have rains enough to thoroughly soak the ground. Since then we have had frequent and abundant rains.

All vegetation has made a remarkable growth, and there are fears expressed that the late tender growth may not be able to stand the test of a severe winter, otherwise the prospect is extremely good for the coming year.

Strawberries on new vines in Henry county were a good average, but old plantations owing to neglect and drouth were nearly a failure. The canes of blackberries, black and red raspberries were more or less injured by the combined effects of drouth and root injury of the previous disastrous freeze in February.

Of diseases, either scab or blight I noticed but little. Of injurious insects there were a great abundance and their work was very effective. Especially is this true of the Curculio and Codling moth for never before have I seen such a great proportion of defective fruit. All of August and half of September was dry and hot. On the eleventh day of September came the last "straw", I was going to write but think "cane" would be better and "hurricane" at that, almost cleaning the peach, pear and apple trees of their fruit.

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Notwithstanding all of these discouragements we are up and at it again.

I have correspondence in Van Buren and Washington counties and their per cent added to mine give an average of the crop for this year.

Apples, early, 80 per cent.
Apples, late, 38⅓ per cent.
Pears, 75 per cent.
Plums, American, 30 per cent.
Plums, European, 60 per cent.
Plums, Japan, 16⅔ per cent.
Peaches, budded, 70 per cent.
Peaches, seedlings, 71⅔ per cent.
Cherries, early, 70 per cent.
Cherries, late, 55 per cent.
Grapes, 43⅓ per cent.
Strawberries, new, 66⅔ per cent.
Strawberries, old, 28⅓ per cent.
Raspberries, black, 70 per cent.
Raspberries, red, 47⅔ per cent.
Blackberries, 50 per cent.
Gooseberries, 58 per cent.
Currants, 60 per cent.

REPORT OF DIRECTOR OF THE SECOND DISTRICT.

BY A. BRANSON, NEW SHARON.

The apple crop early in the season promised an abundance, but before picking time a large part of the crop was blasted, largely caused by insect pests; but little spraying done among farmers. How can the horticulturist get this spraying question before the people in a practical way? We trust this subject will claim the attention of the members at our annual gathering as never before.

The varieties most prolific in fruit this year were Fameuse, Ben Davis, Jonathan, Black Annette, Willow and Janet. Janet were so loaded that they were rather small for shipping; not so wormy as other varieties; after setting so full, they should have been thinned or cultivated and manured.

Cherries three-fourths of a crop. Montmorency were the most productive and very fine, and for our county, the best market cherry.

Plums almost an average crop. American varieties most abundant, but the Domesticas were unusually fine, especially where sprayed, but did not command the price they usually bring on account of the abundant peach crop.

Peaches abundant of almost all varieties that were left after the severe winter of '98 and '99. The Friday was the most abundant and sold readily at $1.50 per bushel. There were more left of these than other varieties. The three-year-old trees fruited to their utmost capacity, of medium size and best quality.

Grapes a fair crop on vines left and sold for five cents per pound. There will be an unusual amount of grape vines planted next spring among the farmers.

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Strawberries, raspberries and blackberries about half a crop, but the season has been very favorable for the new plantations.

The following from J. Forster, Monroe county: "Strawberries, some patches as fine as could be, others almost a failure. Raspberries and blackberries badly winter killed, only a fair crop. Cherries average crop; Wragg a shy bearer. Plums, some varieties, as Wild Goose, De Soto, Red Gage and Blue Damson, were our best bearers. Young trees of the Friday peach were heavily loaded and very fine in quality, medium in size.

"Mr. Graham had the Champian as fine as I ever saw. Grapes mostly winter killed, and consequently a short crop. Young apple orchards, where they were properly cared for, gave us a fine crop. Old orchards, as a rule, were poor except where sprayed. We have one orchard in this county that is handled about right and carefully sprayed each year; nearly all the trees in this orchard were loaded with fruit free from worms, which found ready sale."

REPORT OF DIRECTOR OF THE THIRD DISTRICT.

BY J. P. JACKSON, GLENWOOD.

The result of the fruit crop in general in this district, was not very encouraging and yet upon the whole was not so bad after all. Early in the season there was every indication of a heavy crop of apples. Never was there a time when the bloom was more abundant and fertilization seemed to be almost perfect as the setting of the fruit proved, but as the season advanced close observation showed a lack of vitality, causing a slow development of the fruit, still, the prospect for a good crop was flattering up till the first of July, when the apples began to drop and in many cases the foliage also, the leaves turning yellow as in the autumn. It was evident that this was the effects of root killing of two years ago and not attributable to the season. Whatever the cause, many varieties dropped all of their fruit before maturing.

From various reports throughout the district I find the apple crop to be about as follows: Summer, 65 per cent of a crop; fall, 45 per cent; winter, 25 per cent. Most of the summer apples were of good quality, fall varieties rather poor, while winter apples were very inferior, and will not keep. Cherries were 65 per cent of a crop and of fair quality; plums, 35 per cent; grapes, 30 per cent; blackberries, 55 per cent; currants, 55 per cent; raspberries, 70 per cent; strawberries, 62 per cent; peaches, budded varieties, where not injured, about 20 per cent; while seedlings were about 55 per cent. Taking the general fruit crop as a whole, it has been fairly encouraging, with buds abundant and well set. There is as good prospects for a fruit crop next season as we have ever had. We have more moisture in the ground at present than we have had any fall in the last ten years, and all fruits have made a fine growth, and seem to have plenty of vitality. There is one thing I think we may expect, and that is, that we will, in the next ten years, see the majority of the old orchards a thing of the past, but this is not a very discouraging feature as many of the older orchards are past the profit point already, and we must necessarily look to the young orchards for

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our apple supply in the near future, and this brings up again what I have been advocating for some time—that we should plant some trees each year and not depend entirely upon the old trees that have had their balance on the credit side of the ledger for years. So, let us plant the fruit, take the best care of it possible, being careful what we plant, for surely we have learned some lessons in the past along this line. Move up to the front rank in horticulture. Do not be contented to take even second place in this work.

REPORT OF DIRECTOR OF FOURTH DISTRICT

BY N. K. FLUKE, DAVENPORT.

Many fruit trees that were partly injured by the extreme freezing of two years ago, set a crop of fruit, but succumed the past summer for want of thinning the fruit and giving the trees good cultivation. Healthy apple trees generally bore well, but dropped much fruit. Insects were the cause to a considerable extent, but starvation and neglect had more to do with it than anything else. Eight out of ten farmers' orchards you see are generally in blue grass pastures for calves and other stock.

Very few sound marketable apples were grown in this discrict. Markets supplied generally by New York growers. The limited number of pear trees growing with us were heavily loaded. Blight was not very troublesome, but was quite bad (as is usual) in orchards protected by groves, not having much air circulation. Our plum trees, both natives and Europeans, with the exception of Miner and Wild-Goose, set a full crop but the rot destroyed more than half of them. The Tatge was loaded, but not a specimen was saved on trees I had planted. Some native varieties are not so subject to its ravages as are others. We should be on the lookout for these and not breed from them.

Cherries, from the information I could get, gave an average yield. Seedling peach trees generally ripened a full crop. The budded varieties that survived the hard winter also gave some returns. Very few grapes were grown, market supplied by New York.

Those who renewed their blackberry plantations were rewarded for their labor with a half crop, but fair prices were realized.

Early strawberries from southern localities glutted our market for some time at low prices, but as soon as the home grown berries appeared, good money was received for them and they shut out the shipped berries.

I do not believe that I ever saw more dead leaves clinging to trees, at this time of year, than there is at the present time in our locality, especially of the apple and cherry; young and old trees alike. A period of late growth caused by late rains following a dry period in the early fall, will, I fear, cause some injury to trees and plants if we should have severe cold this winter.

The notable absence of plant lice the past summer was a feature we seldom see in our part of the state, but had our full quota of other troublesome insect enemies to battle with, giving us all we wanted to do.

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REPORT OF DIRECTOR OF THE FIFTH DISTICT.

BY W. O. WILLARD, GRINNELL.

During the last two years many orchard trees have been killed, or left in a damaged condition, especially among the older trees of the apple, cherry, and the plum. Trees in good condition were generally well loaded with fruit. The crop was large of summer and fall apples, and the fruit was of good quality. Winter apples reported much less in yield and the quality not so good as the earlier fruit. This was due very largely to the effects of the Codling moth.

Our orchards are planted too largely to early varieties. Summer and fall apples were a drug on the markets at unprofitable prices, while we had to depend upon the East for our winter supply. We should remedy this condition by planting a larger proportion of our orchards with our best winter sorts and by systematic spraying.

Cherries produced well. Those in bearing are largely Early Richmond, with some Montmorency, English Morello, Wragg and a few other varieties.

Plums were not a full crop. Wyant, Wolf, De Soto and a few other sorts produced well, but there were many varieties which bore but little or no fruit.

A few peaches and pears were grown in the south part of the district.

Currants were a good crop. Victoria and White Grape seem to be the most satisfactory. Pomona is very promising. There was a fair supply of gooseberries, mostly Downing.

Blackberries have not made their appearance to any great extent since the last so called "Test Winter." Raspberries suffered from the drouth which extended through the winter. The canes were badly killed back with some loss of the entire plant. The crop was necessarily light.

Grape vines were very generally killed two years ago, and the vines since planted are not of bearing age.

Strawberries were a failure as to profit. The crop was very light, due in a measure to the weakened condition of the plants used in the spring of '99 for the new plantations, but also very largely to the drouth which commenced early in August and continued all through the growing season.

With a few exceptions prices have been good. The abundant moisture during the growing season has been favorable for the production of new wood; the growing of strong, well rooted plants, and the promise of a bountiful crop for the coming season.

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REPORT OF DIRECTOR OF THE SIXTH DISTRICT.

BY A. L. PLUMMER, IVY.

Spring opened favorably, there being no late frost to injure fruit. Raspberry canes were badly injured during the winter and consequently a light crop of fruit. Strawberries a light crop. The dry weather in the fall being unfavorable to the growth of new plants possibly accounts for the shortage. Gooseberries a light crop. Currants a fair crop. Cherries bloomed fairly well but set a light crop of fruit, though wormy they sold for $2.50 to $3.00 per bushel. Plums, the Domestica set a good crop of fruit but rotted and fell off before ripe. With me the Americana set a very heavy crop of fruit, they loaded to breaking down and the fruit was undersize. A number of varieties scabbed badly, notably Forest Garden, De Soto, Speer, Hawkeye and Stoddard, they were almost worthless. Plums in the city of Des Moines sold for $1.50 to $2.00 per bushel.

Apple trees bloomed profusely but set a light crop of fruit. The summer varieties seemed to yield best and sold at 50 to 75 cents per bushel. The winter varieties were a light crop and inferior in quality as a rule. Apples on young trees were fairly good, but all ripened premature. Jonathan and Grimes Golden were all ripe in October and the Willow Twig was mellow the fore part of November. The late varieties sold at from 75 cents to $1.25 per bushel.

J. W. Blackman of Nevada, Story county, writes me that he thinks apples in his county a fair crop judging mostly from his own small orchard. Plums scarce and in good demand at $2.00 per bushel. They had a good crop, the Wyant taking the lead in productiveness. No peaches and very few grapes, a few pears on some young trees. Early cherries a light crop, selling at $2.15 to $2.40 per case. Late cherries (Wragg) were a heavy crop, selling $1.50 to $2.00 per bushel. Strawberries a light crop in the county but had a fair crop of his own and received good prices, bringing nearly or quite $400.00 per acre, sold at $2.00 to $3.25 per crate. His raspberries did not exceed ten cases per acre and sold at $3.25 per crate. Currents and gooseberries a failure.

Mr. Graham of Adel, writes: "The small fruit crop was lighter throughout Dallas county than for many years past; blackberries and grapes were almost a total failure, all the result of the extreme cold of February, 1899.

"The cherry crop was quite satisfactory, (about one-half crop) and sold readily for good prices. The varieties giving the heaviest yield were Dyehouse, Early Richmond and Montmorency, both "ordinaire" and long stem. Plum crop very light as bearing trees were nearly all killed at the root by the 'big freeze.'

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"The apple crop was very uneven, some orchards bearing satisfactorily and others little or none. A large portion of the crop where trees were full was blown off by high winds in August and September and rendered unfit for market.

"The pear crop was much more satisfactory than the apple. Kieffer trees, five years in orchard, in cultivated ground, yielded from one-half to one bushel per tree of very fine fruit. Warner, Longworth, Birkett and a number of the finer varieties also produced well."

REPORT OF DIRECTOR OF THE SEVENTH DISTRICT.

BY B. SHONTZ, CORRECTIONVILLE.

This past year was very good for planting trees and all kind of plants. Trees have recovered from the effects of the cold winter of 1898 and 1899 better than I expected they would.

Strawberries were a fair crop where there was a good stand, but owing to the very dry fall of 1899 they did not take root freely and the stand, as a rule, was small, but a better quality of strawberries never grew. Raspberries and blackberries were all winter killed, owing to the dry condition of the soil.

Grapes, where they survived the winter, bore very fine crops. Plums were a light crop in most places, although on my grounds I had a good crop from such trees as Wyant, De Soto, Miner and Wolf. From a plum tree we call the Troesel plum I had a full crop of fruit.

Pear trees did not bear fruit but the trees are in fair condition.

Cherries were a light crop. From some cause, I do not know, the bloom was weak; probably it was the effect of the dry condition in the fall.

Apples were a full crop in this section this year. Wealthy was fine. Duchess good, Maiden Blush, Fameuse, Yellow Transparent and Plumb Cider a full crop. In fact all apple trees that were old enough to bear a crop gave us apples that sold for good prices. Prospects for a good crop of all kinds of fruit for the year 1901 are No. 1 at present time.

REPORT OF DIRECTOR OF THE EIGHTH DISTRICT.

BY R. P. SPEER, CEDAR FALLS.

There was but little snow in the greater part of the eighth district last winter, and after the frost came out of the ground, the weather was dryer than usual until about the first of July, when there was enough of rain to wet the ground from eight to twelve inches in the different parts of the district. Afterwards during July, August and September, the rain-fall was sufficient to keep the pastures in unusually good condition; but not enough to put the sub-soil in proper condition for large fruit trees. The very dry condition of the sub-soils last spring caused many apples to drop from the trees prematurely; but in most instances enough of early apples were left on the trees to

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produce average crops, especially in the western part of the district. From the middle of August until the first of October apples were very plentiful, and many of them were sold for very low prices. My brother and I delivered eight hundred fifty bushels of good Wealthy apples on cars in Cedar Falls for the Minneapolis market for thirty-five cents per bushel, and many Duchess and other early apples were sold to the grocerymen of Waterloo and Cedar Falls for from twenty to twenty-five cents per bushel.

We have planted entirely too many early apples, and every year good Iowa winter apples are very scarce. Iowa apples are not keeping well, even in good cellars, as dry sub-soil caused them to ripen prematurely. Trees died in many orchards last summer, on account of root injuries, which they received in February, 1899, when most of the strawberries and grapes, and nearly all of the old raspberries and blackberries, were destroyed. Younger raspberries produced average crops of fruit last summer, and thrifty young plum trees of the best American varieties were fruitful; while trees of the same varieties which had produced several crops of plums, were unfruitful.

A much smaller number of fruit trees and small fruits were planted last spring, than in years prior to the winter of 1898–99. Many farmers have lost confidence in their ability to grow the tree-fruits successfully. Radical changes should be made in the lists of the tree-fruits which are recommended for the northern half of Iowa. Too many of the apples, which nurserymen call winter apples, will not keep in a good cellar later than the middle of November. Better keepers like the Ben Davis and Willow Twig are wanted, but such apples are not hardy enough when they have been propagated by root grafting them. To prevent the purchasers of fruit trees from being deceived, I would suggest that hereafter the Wealthy should be described in our lists of recommended fruits as an early fall apple, and that such apples as the Pewaukee and Grimes' Golden should be called late fall apples.

REPORT OF DIRECTOR OF THE NINTH DISTRICT.

BY B. F. FERRIS, HAMPTON.

Fruits and flowers, vegetables and grains in quantity and quality unsurpassed, is the report I have to make from the ninth district.

Fruits of all kinds generally grown here was plenty, and notwithstanding they were cheap, the growers were well paid for the expense of growing.

The bountiful apple crop, mostly summer and fall fruit, could not be consumed at home and much of it had to find a market outside the state. Coming in contact with the eastern grown apples, ours were outclassed on account of size. (Querry). How increase the size? This question I have solved to my own satisfaction at least.

In our reports of past years frequently appears the advice to reduce the quantity and thereby increase the size. Shake or pick off part of the fruit is generally advised, but as this is seldom practiced, I think judicious pruning should be recommended. I believe it to be more practical, more permanent, and at least as effectual as the other mode.

Specimen apples are found on young trees. Small, inferior fruit is more frequently found on large trees, with tops massed together almost like asparagus.

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It is surprising to see the amount of small branches that can be removed from the top of an old neglected tree, and still more surprising to see the difference before and after treatment, and also in orchards treated and those not treated. Am I correct in this theory? If not, I want to be corrected.

I do not want to advise extreme cutting away of large branches from old trees, although if the wound is properly covered with wax, or even paint, I would not hesitate to remove objectionable ones, but pruning from the start is the proper way. By keeping the top open you will not only get larger but higher colored fruit.

De Soto plum trees cannot live long if allowed to grow a heavy, thick top and overbear, as they surely will if allowed to, the plums will be small. My treatment would be the same with them as with the apple.

Very little appears in our reports about pruning and that little is mostly to shape the tree; but these two facts remain, first, an overloaded tree will not bear fair samples and second, small fruit will not sell.

Whether its proper place is in a director's report or not, I am going to mention a remark I heard at the meeting of the Northeastern Iowa Horticultural Society at Iowa Falls last month: "Why not give more attention to keeping what apples we can successfully grow in the north, in place of devoting so much time and spending so much money in trying to grow what we can keep. That is, spend some of the money we are now spending for winter apples, in cold storage plants."

We ship out our summer and fall fruit or make it into cider, for which there is no market, or let it waste, realizing from nothing up to thirty cents per bushel, and straightway our merchants fill their cellars with importations for which we are taxed from $1 to $1.50 per bushel.

I do not wish to be understood as representing that we have no prospect of raising our own winter apples, for the Walbridge is a hardy tree and a good, if not an early, bearer.

The Northwestern Greening is so far all that its friends have claimed for it. The Gano and Salome are both filling expectations, and while we hope for the best, we do not know what a winter like that of '84 and '85 will do to them. I could mention several others of some value, but they are well known.

My impression is, cold storage can be had at less expense than is generally supposed. A groceryman in Hampton has a room in connection with his store about 12x15 feet, in which he stores the Oldenburg every year, and always has them on the market in good shape, until sold. The extra expense of fitting the room for cold sorage could not have been $100.

In a report I made at our meeting in Iowa Falls I mentioned the serious effect of the apple scab. It is so serious I will repeat it, as when fruit is afflicted with the scab it becomes almost, and often, quite worthless; I have used insecticide early in the season but have not sprayed for the scab. We in Iowa are not suffering alone, as the imported apples are afflicted about the same as the home grown. A brownish spot forms while the apple is growing and remains almost dormant until fruit is stored; then it penetrates until the destruction is complete. While this trouble is common it is not universal. Some orchards show but little of it while others have some varieties nearly or quite ruined.

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While the tree fruits get the lion's share of attention, as they should, small fruits deserve their share. They are being grown more by farmers every year. Many that bought for home use until recently, now have from a few crates to many hundred quarts for market. Still the demand seems to increase faster than the supply. Especially is this true of the strawberry.

REPORT OF DIRECTOR OF THE TENTH DISTRICT.

BY P. F. KINNE, STORM LAKE.

Reports from all portions of the tenth district indicate a better than average crop of small fruit, with the exception of cherries and gooseberries, both of which were a very light crop. Much damage was also done the currant crop by the currant worm. Generally a light crop of plums was reported, owing mainly to too much rain at the blooming period, there appeared too, to be a lack of development in the fruit buds which very materially shortened the blooming period. The few grapes that pulled through the disastrous winter of '98 and '99, fruited heavily and fruit was of good quality owing to seasonable rains. Moderate crop of blackberries and a good crop of dewberries. Raspberries a good crop. Probably the largest crop of apples was gathered that the tenth district has ever produced. Duchess and Wealthy took the lead in number of bushels, these being more widely planted than other varieties. Longfield bore heavily where planted. Harry Kaump, Haas, Fameuse, Ben Davis, Plumb's Cider and Whitney bore the bulk of the crop because more extensively planted. Yellow Transparent, Charlamoff, Anonovka, Breskovka, Gypsy Girl, and Vena Rosa bore heavily where planted. All varieties of apples made a vigorous growth but did not thoroughly mature their wood. The season was remarkable throughout for plant growth. Strawberries coving the ground more completely than for many years, so much so that it becomes a problem for the planter to solve of how best to manage them.

REPORT OF DIRECTOR OF THE ELEVENTH DISTRICT.

BY ELMER REEVES, WAVERLY.

The fall of 1899 was somewhat dry and December a cold month. Warm weather came toward the last of January, followed by severe cold similar to the weather of the previous year but not so severe.

While the damage to trees was not nearly so great many trees that were injured in '99 were finished and there were many nursery trees killed, especially in the north part of the district. Small fruits also were much hurt.

April gave us very little rain but it was in May that we began to realize that a severe drouth was upon us and it lasted until about the first of June. Early planted seeds, newly set trees and small nursery stock suffered badly. The strawberry crop was a failure and other berries gave a light yield.

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Plums also produced but little fruit in most places while in a few orchards there was a good crop.

Apples did much better and usually there was a fair crop. Insects were more plentiful than usual and as but few orchards were sprayed the apple crop was badly damaged. Nearly all the fruit offered for the early market was wormy, and as a consequence it was of little value. A few who sprayed are pleased with the results

Wealthy is getting to be a great apple both for home use and for market although there are not enough raised to give anything near a general supply through the fall. Grapes are not much grown, but where cared for in a reasonable way they produce well.

There is a growing interest in the planting of trees but not as much as there should be, especially in the planting of groves of forest trees.

The following list of fruits are recommended for general planting and are the most reliable, but do not include all that may be grown to advantage in the district.

Varieties of fruits recommended in eleventh district.

Apples.—Yellow Transparent, Tetofsky, Oldenburg, Pointed Pipka (Charlamoff), Whitney, Longfield, Wealthy, Tallmans Sweet, Briars Sweet, Martha, Pattens Greening, Northwest Greening, Walbridge, Malinda.

Cherries.—Early Richmond, English Morello, Wragg.

Plums.—De Soto, Wyant, Wolf, Miner.

Currants.—Victoria, Red Dutch, White Grape.

Grapes.—Moores Early, Worden, Concord.

Blackberry.—Snyder.

Raspberries, Red.—Turner, Louden.

Raspberries, Black.—Older, Kansas.

Strawberries.—Crescent, Warfield, Beder Wood, Lovett.

Gooseberries.—Houghton, Downing.

The Juneberry should be generally planted while the Sand Cherry is a fraud as a fruit, not being of as much value as the Choke Cherry. A list of things discarded is hard to give as a variety may do fairly well in some places and not in others and the taste of different growers call for many of the old sorts not generally grown. It would be safe however, to discard a large list of the Russians as they are poor, both in tree and fruit. The term Russian, should not be generally used as it only serves to bolster up a lot of sorts that are worthless to the detriment of some that are of decided value.

REPORT OF DIRECTOR OF THE TWELFTH DISTRICT.

EUGENE SECOR, FOREST CITY.

The loss in my district from winter-killing the past two winters does not seem to be so great as in parts of the state supposed to be more favored. The reason for this, probably, is the fact that more snow fell and remained on the ground during our most severe weather.

Grapes, raspberries and blackberries suffered a good deal last winter if uncovered. I think the value of a good mulch covering has been emphasized

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several times of late. Farmers have found that they can not pasture timothy and clover closely in the fall and have a perfect stand and vigorous growth the next year, especially when a snow-covering is lacking. As the dead grass acts as a mulch for the roots, it is reasonable to infer that some protection for tree roots is a good thing. And so it has proved.

Apples were a wonderful crop in 1900. The trees were too full, as the fruit was reduced in size and the local markets overstocked. Summer and fall apples sold as low as 25 cents per bushel in some towns. One reason for this, however, was that farmers brought in wind-falls and immature fruit till prices were demoralized, and then it was hard to re-establish a remunerative price. A friend remarked that we raised too many apples or else not enough. Whoever has an orchard large enough to attract buyers from abroad generally finds a better market than he who has ten trees.

In my locality plums were a failure. Even the natives were scarce. Their off year frequently comes when apples are "on." Thus is nature's balance sheet never devoid of some hopeful figures. In some other parts of the district, however, plums were a good crop.

Strawberries were not a large crop—too dry at the critical time.

Raspberries, fair crop. Older gives best satisfaction for hardiness.

Orcharding and tree-planting is not declining. Mr. Jasper Thompson, of my county, has put out several large orchards in the last three years, and never gets weary of planting evergreens and other trees on his farms for wind breaks. May his tribe increase.

Top-working is receiving more attention than formerly. Varieties whose home is two hundred miles south are being top-grafted on crabs and Hibernal in the hope to extend the northern limit of some of our luscious but tender apples. Even if the top-working is not profitable, the seeds which may be secured by crossing with our hardy varieties may solve the problem of future success.

As root killing of all our fruits is a serious menace to future orcharding, the necessity of hardy root grafts is more and more apparent. Unless our hardy kinds get onto their own roots above the union there is need of hardier seedlings for nursery stock. If a Wealthy tree on a seedling from the south is no hardier than its nurse, we ought to go to the northern limit of apple growing for our roots for grafting.

The most popular fruits in my district, so far as I am able to observe and learn, are:

Apples.—Tetofsky, Oldenburg, Wealthy, Longfield, Patten, Haas, North Western Greening, Fameuse, Walbridge, Wolf River. Malinda seems promising for winter. Others are being tried. All the crabs do well except those subject to blight. Of the latter, Transcendent and Hyslop are the worst and will have to be discarded.

Plums.—The Americans are the only ones I would recommend although I have seen very nice Lombards raised.

I don't consider myself competent to recommend a list of plums, as localities differ and what will give excellent satisfaction in one place will prove a failure in another.

Cherries.—I don't know of a single variety that will prove profitable in my district unless it is the Wragg.

Raspberries.—Older for black; Cuthbert for red.

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Blackberries.—Snyder.
Currants.—White Grape, Red Dutch, Knight's Improved.
Gooseberries.—Pearl, Houghton, Am. Seedling.
Strawberries.—Crescent, Warfield, Bederwood.
Grapes.—Concord, Moore's Early, and Worden.

I append an interesting letter from Miss Jennie Elder, of Garner, Hancock county, daughter of James M. Elder, a former vice-president of this society, now deceased. It will call to mind some of the life work of that honorable man, who labored in horticultural fields from love of it, and not from mercenary motives.

GARNER, IOWA, Dec. 7, 1900.

Mr. Eugene Secor, Forest City Iowa:

DEAR SIR—Your letter of recent date asking for a report of fruit crop for 1900 received, and I will do my best to comply with your request, though the result is sure to be quite incomplete.

Our small fruits did not do well. Strawberries and raspberries were not more than half a crop while blackberries winter killed badly and were a total failure. The lack of raspberries was due to the same cause, I think.

The cherry trees bloomed profusely, but the resultant fruit was hardly sufficient to feed the birds. Early Richmond, coming into bearing for the first time, gave a fair yield.

Plums were a good crop both as to quantity and quality, in fact, never better. The Wolf, De Soto and Early Red, only three or four trees of each, gave us nearly thirty (30) bushels of fruit. The Wyant with us is fine as to size and quality but is not a prolific bearer.

As to the apples, as nearly as I could estimate, the crop amounted to about 800 bushels, mostly summer and fall varieties. Of these there were perhaps 200 bushels each of Duchess and Whitneys (too many of the latter) and about 100 bushels of Wealthies. As nearly as I can give them the varieties of trees planted by my father, and now in bearing, are as follows: Duchess, Whitney, Wealthy, Haas, Wolf River, Plumb's Cider, Russett, Vargulek, Recumbant, Longfield, Fameuse, Canada Red, Black Annette, Utter's Red, Crimea Boy, Iowa Beauty, Striped Amis, Gen. Gregg, Patten's Greening, Antonovka, No. 590 M, 413, Florence (crab), Lou, Excelsior, Peter; Silkenleaf, Good Pleasant, Waldbridge, Malinda, Pewaukee, Tetofsky, Yellow Transparent, Charlamoff. Crabs—Virginia, Alaska, Martha, Siberian and a sweet variety not named.

You will see I have included some Russian varieties. In the spring of 1893 my father planted one orchard exclusively to Russian fruit—about thirty varieties of apples. A number of these were destroyed during the winter of '93 and '94, and the rest have not yet come into bearing.

With this long list we are still without an apple we can absolutely depend on for winter. The Walbridge and Black Annette coming as near to keeping as any, and even they are failing us this year, decaying from blemishes in the skin.

An apple fruiting for the first time this year is keeping better than others. I call it the Malinda but am not at all sure of the name. It is nearly pear shaped, in color yellow with a slight blush on one side, and quite sweet.

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I realize this is a very mixed up report, if it can be called that, but perhaps you may pick out something of what you want.

Yours truly,

JENNIE E. ELDER.

A MEMBER: I would like to speak about the fungus that is troubling apples that Mr. Ferris referred to in his report. When the fruit is stored away it does not seem to stop its increase. For instance, you may barrel up apples having but a small spot and two or three months later the apples would be almost covered with it. It is quite destructive. It certainly needs to be worked against.

ELMER REEVES: Did you use the ice cold storage?

B. F. FERRIS: We had ice cold storage within the last two or three years. The only objection the parties had to it was that it was injuring their butter and eggs, but by making a present of a basket of apples, I found it would do no harm. This year they allowed us to store quite a number of bushels there.

A MEMBER: When did you put these apples in cold storage?

ANSWER: About the 20th of August.

MR. PRESIDENT: You put them in about the time the seeds began to color?

ANSWER: Well, they were not fully colored, but they were just browning up nicely. These apples colored up considerably since they were picked. I think one great field for us to develop, is the keeping of fruit we can raise. We can raise Wealthy apples in any quantity, but why can't we develop a way of keeping them, in the way of cold storage and have them all winter long and while we are working for that ideal winter apple, we can enjoy the Wealthy apples. They are good enough for most of us.

THE PRESIDENT: The next subject on the programme, is a discussion on fifty varieties of apples. I will call on the Secretary to lead this discussion.

THE SECRETARY: I simply want to take a little of your time to talk over the work we have been doing the past year. I have no formal paper to present, but want to call your attention to a few varieties, or a number of varieties, and let you do the talking. We sent to the members of the society (I mean the auxiliaries as well as the state society) two circular letters containing the names of fifty-four varieties of apples that had been mentioned in the report of a committee appointed by President Gardner, to prepare a list of recommended and discarded fruits in each of the twelve districts in the state. This list does not include all the varieties

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mentioned in that report, but enough from each district was taken so as to show the general distribution of varieties over the state.

I did this for the purpose of locating, as it were, the distinct areas in which each variety was grown. It was to help those who, living in different localities in the state, want to know what varieties to plant.

From three hundred letters sent out we received over one hundred and fifty replies. We have compiled these answers and maped out, as it were, the area in which each variety thrives, and we want to show you this distribution of varieties, or in other words, the life zones of these apples, grown in Iowa.

As a result of this inquiry, we found ten varieties that may be planted, with some assurance that they will prove sufficiently hardy, in any part of Iowa. There were only nine in the list. We did not include the Duchess because it is recognized as a hardy apple anywhere in the state. In saying that these varieties are hardy, we would not have you understand that they are all desirable nor that we recommend the planting of all of them. They are Oldenburg, Yellow Transparent, Longfield, Tetofsky, Red Astrachan, Plumb Cider, Walbridge, Wealthy, Wolf River, and one crab, Whitney No. 20.

Six of these would be put on the summer list in the larger part of the state, three on the fall, and only one that is a long keeping, winter apple, the Walbridge. We do not intend to enter into a discussion of the merits or defects of any variety at this time, but only to show you their distribution. To this list might be added four or more varieties that are, perhaps, sufficiently hardy in the northern part of the state, but have not been tested so extensively in the southern counties to determine their defects under a higher temperature. These are Northwestern Greening, Patten' Greening, Haas and Hibernal. Four on the list have a very limited distribution, viz.: Anis, Babbitt, Jeffries and Romna. Only six favorable reports were received from the Babbitt and eleven unfavorable to it. This is not a good showing for the Western Baldwin, as it is sometimes called. Anis received nine favorable reports and seven against it. Jeffries seven for and five against it. Romna received fourteen favorable reports and eleven unfavorable to it. This would indicate that these varieties are not meeting with much favor, nor have they been tested very extensively by the members, when, out of the whole number of votes cast, so few have mentioned them, and this vote was from nearly every county in the state.

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We have prepared maps showing the counties in which each of the varieties have received a favorable report and also counties where the report has not been favorable to it. This is indicated by crossed and parallel lines in the shading on the map. The counties that are not shaded have not reported on the variety under consideration. The first map shows the distribution of the Northwestern Greening. This variety had been favorably reported on from thirty-eight counties, and only two counties report unfavorably of it, Fayette and Monroe. The Salome received favorable reports from nineteen counties; seven voted against it, and three were for and against it. (These are further indicated by a diagonal line.)

The Pewaukee is on the list of standard apples in Wisconsin, but does not make a very good showing in Iowa. Only nineteen counties are in favor of it; fifteen opposed, and nine in doubt as to its value. A serious objection urged against it is, that the fruit falls from the tree. It is defective in the stem. This may, in part, be owing to the aridity of the atmosphere and higher temperature in Iowa, as you will notice on the map that it thrives better in the eastern part of the state where the conditions are more moist and the rainfall is greater than further west and northwest. The lack of moisture and high temperature also has a tendency toward early maturity and dropping of the fruit. The orchards in this state suffer as much from the excessive heat in summer as they do from the cold in winter.

The next map shows the distribution of the Willow Twig. This variety, you will also notice, does the best in the eastern part of the state. The Willow Twig on high ground west of the Des Moines river is subject to blight. Some varieties seem more susceptible to injury from arid conditions than others. If you will study these maps which we have prepared, and compare them with those on temperature and rainfall, published in the last report, you will notice the influence which the peculiar climatic conditions in this state have on varieties that originated under other environments.

The Malinda is a variety that is receiving considerable attention in Minnesota. It is not, as yet, very largely distributed over the state. It seems to do best in the north, where it is more extensively planted than further south. I suppose that all of the varieties mentioned have been tested in every county in the state, but not by members of this society. If we could receive a report from every township in the state how much more satisfactory

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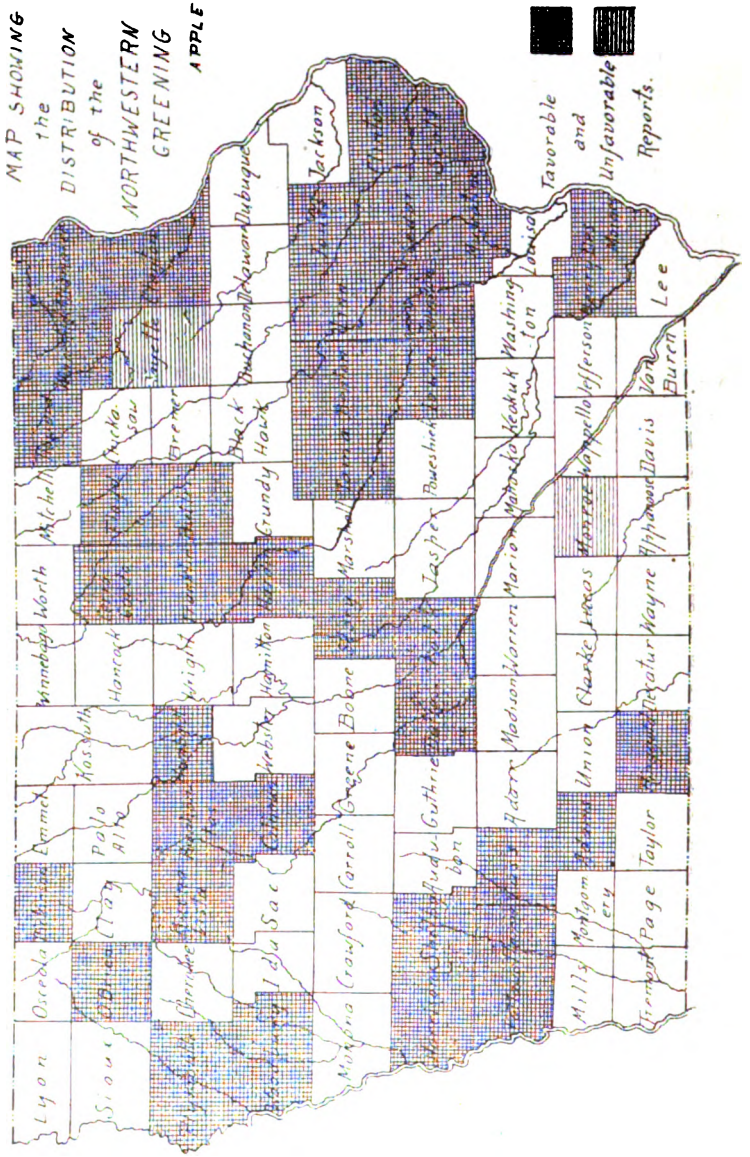

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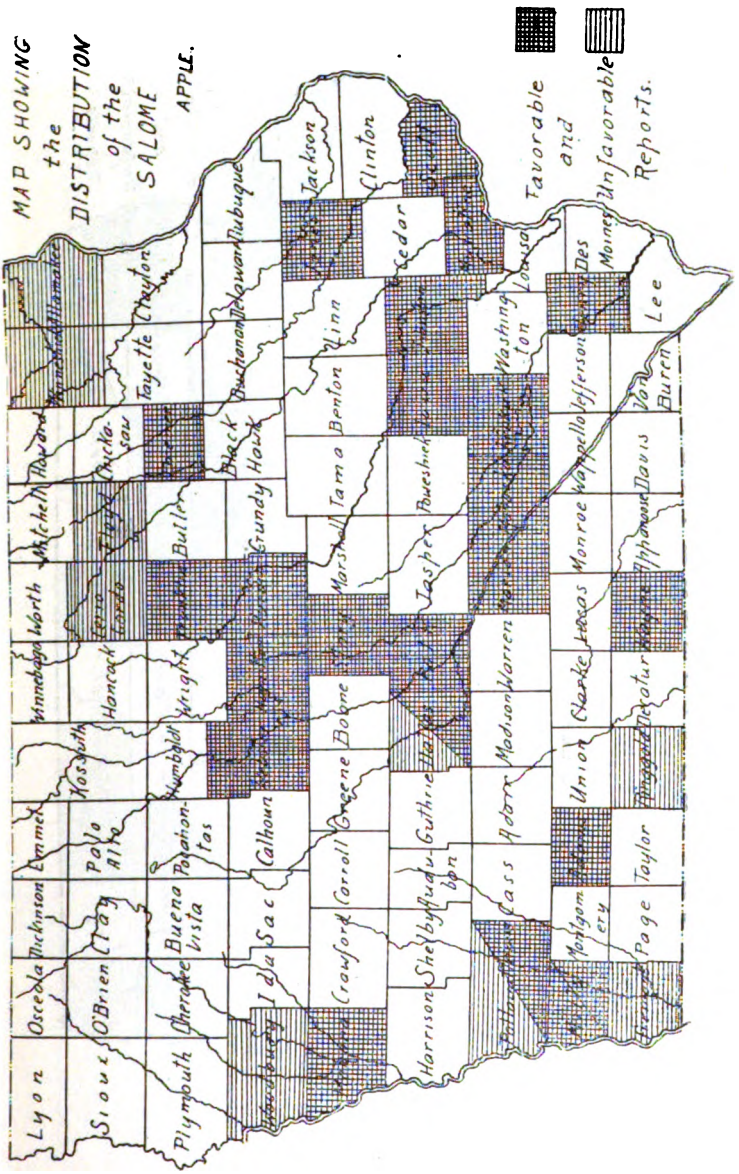

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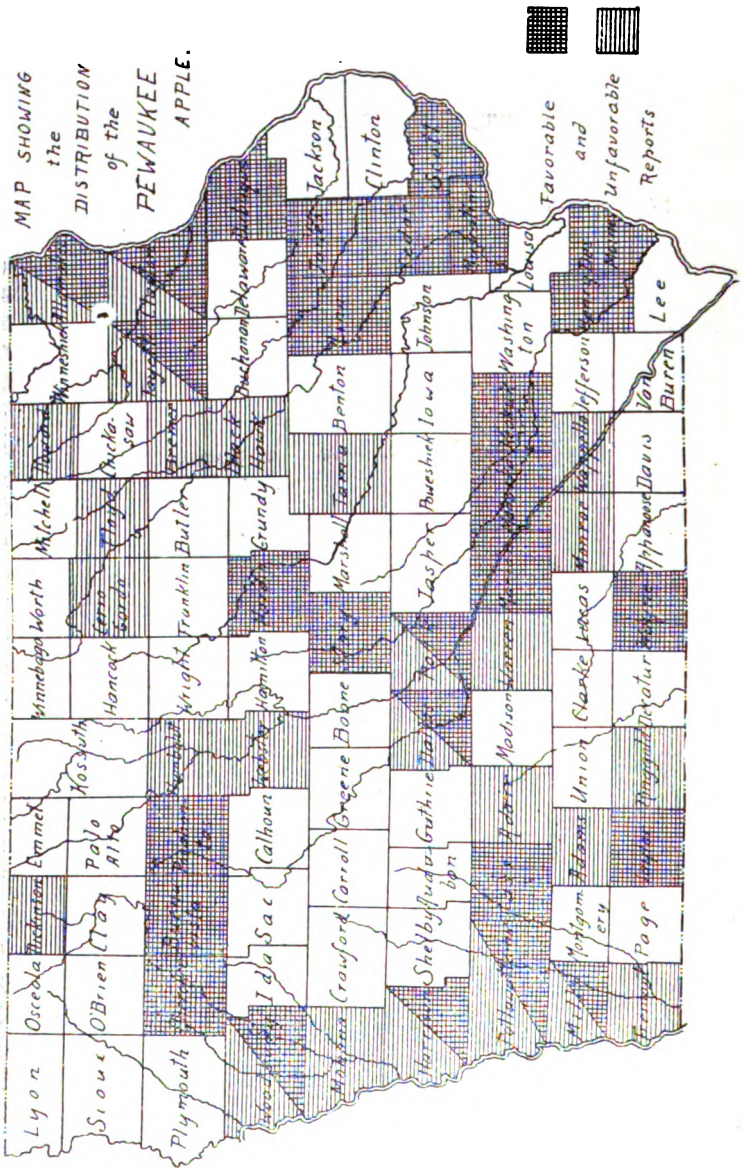

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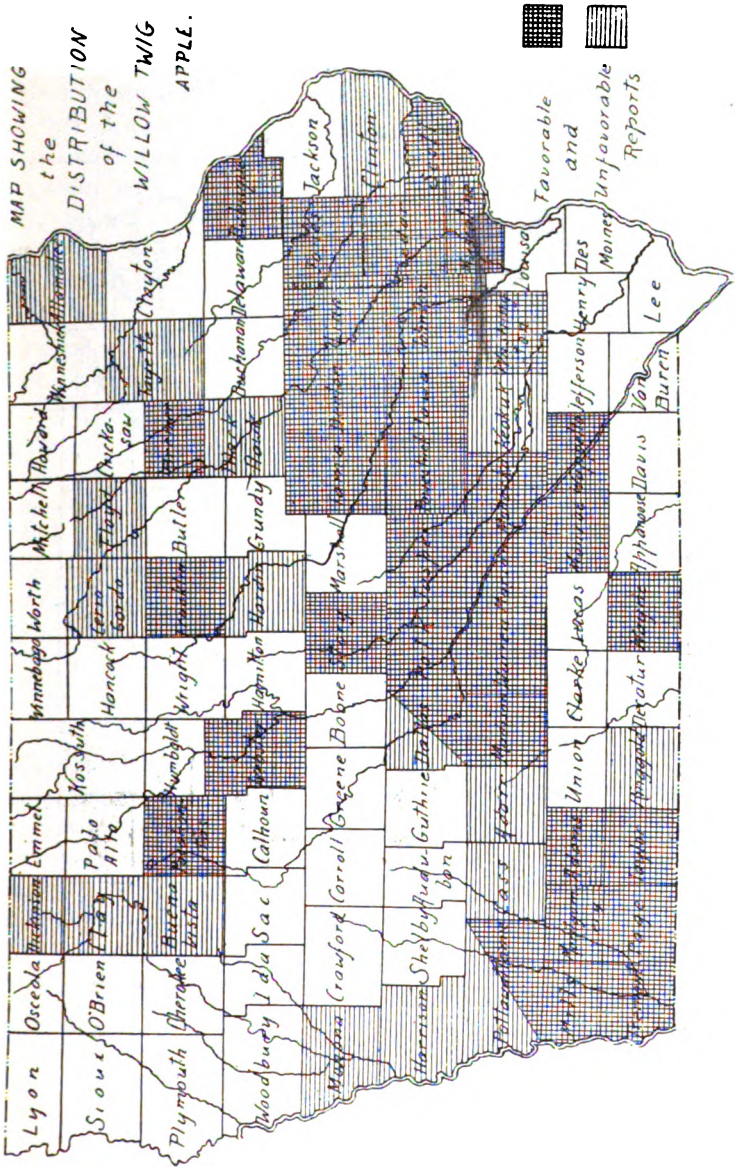

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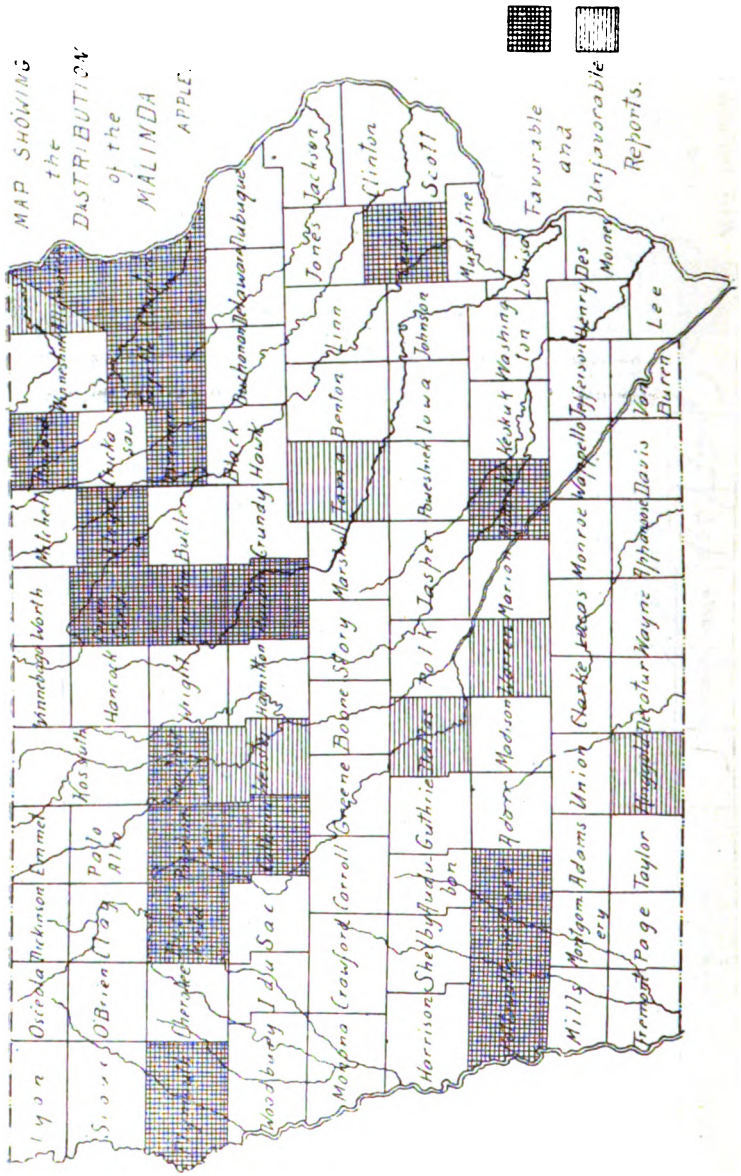

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these reports would be, as they would then cover the whole territory pretty thoroughly. But we can only report on what we have received.

To condense this report as much as possible, we have made two maps showing seven varieties which do the best in the northern part of the state, and four maps showing twenty-three varieties that thrive better further south. The map on page 64 shows Borovinka, Antonovka and Scott's Winter. The lines on which the names of these varieties are written, run through counties giving both a positive and negative report on the variety. All counties south of these lines were negative reports or no reports were received, and those north were positive. Counties not shaded did not report or were negative to the variety under consideration. The territory in which the Borovinka thrives is shown on the map by the shading with crossed lines. No report was received favorable to this variety, outside of the area thus marked.

The Antonovka thrives in the same territory that the Borovinka does and as much further south as the line on which it is written, and Scott's Winter covers the same area as the other two and south to the line on which it is written. Counties south of these lines do not report on the variety mentioned, or the reports were unfavorable to them.

The map on page 65 shows the territory covered by Charlamoff, Harry Kaump, McMahon and Patten's Greening. The four varieties cover nearly the same area. Patten's Greening extends further south and northwest than the other three named. The Charlamoff is reported from Keokuk county, while Kaump and McMahon only extend to Muscatine and Buchanan counties in the eastern part of the state, but in the west they are found much further south than is the Charlamoff. Patten's Greening has been tested much further south than the others named. None of these varieties have been planted extensively in the southern part of the state, nor would we expect them to be when so many other good sorts can be successfully grown there.

We will now take up those varieties which are usually called American apples, or the varieties grown east and south, and are not so hardy as those we have been considering. In the next four maps we read from the southern boundary of the state northward to the line on which the name of the variety is written, instead of southward from the northern boundary of the state as in the two preceding maps.

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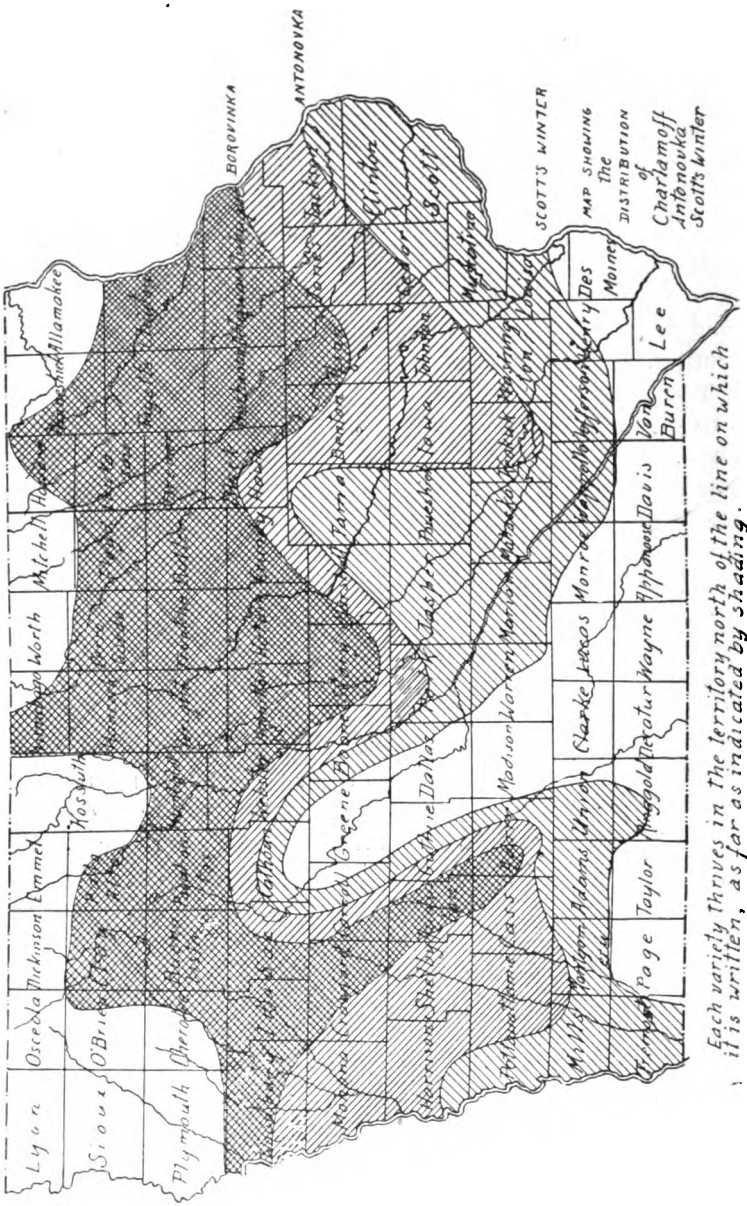
BORovinka
ANTONOVKA
SCOTT'S WINTER
MAP SHOWING The DISTRIBUTION of Charlamoff Antonovka Scott's winter
Each variety thrives in the territory north of the line on which it is written, as far as indicated by shading.

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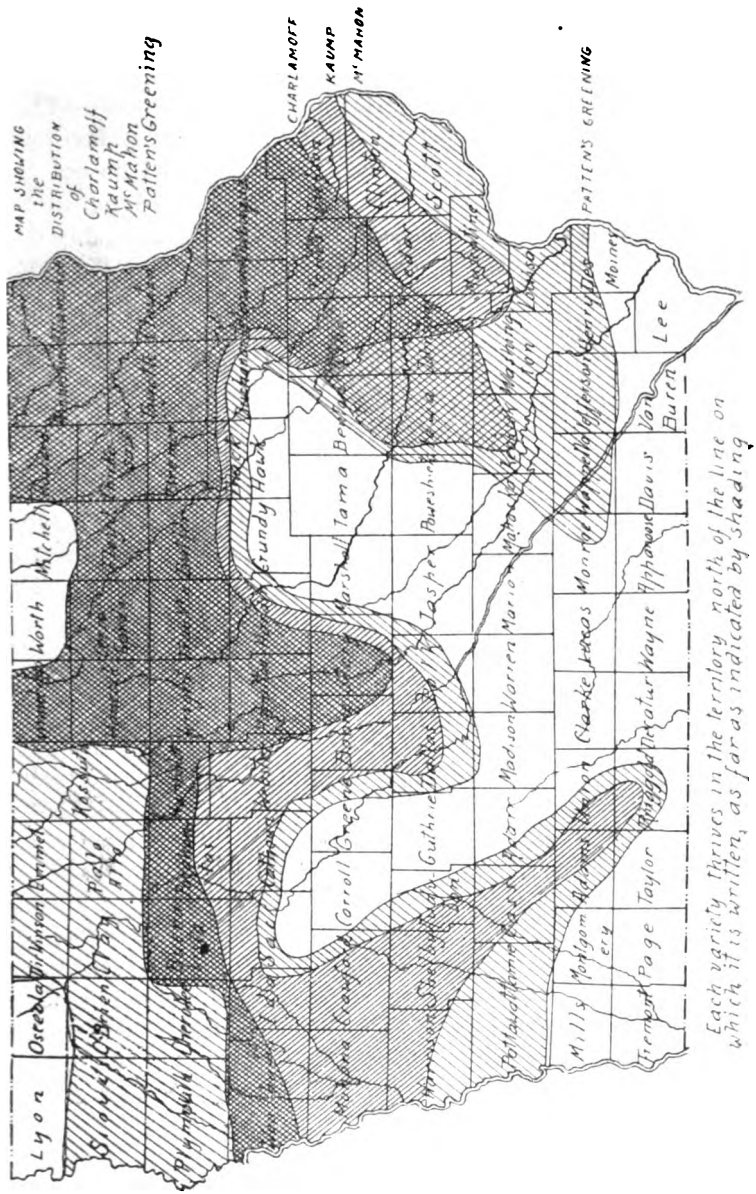
MAP SHEWING the DISTRIBUTION of Charlamoff Kaump McMahon Patten's Greening
CHARLAMOFF
KAUMP
M'MAHON
PATTEN'S GREENING
Each variety thrives in the territory north of the line on which it is written, as far as indicated by shading

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On the map on next page you will notice that Ramsdell Sweet thrives from Washington to Marion, to Montgomery county and along the southern border of the state, while north of that line the reports have been unfavorable to it. Now I hope you will not understand that this is the only part of the state in which the Ramsdell Sweet will thrive, for that would not be true. These varieties do thrive in other protected localities that are favorable, or even in less favorable places where topworked. I do not care to enter into a discussion of the merits of topworking at this time, but will simply say that to use a hardy stock probably does lengthen the life of varieties tender in the roots, or that are poor feeders, and of such varieties as suffer from injury in the body and large limbs from what is called "sun scald" are improved by topworking. In gathering data as to the hardiness of trees, it seems quite apparent that varieties are increased in hardiness by topworking so that they may be safely grown from fifty to one hundred miles further north than when planted on their own roots. Minkler is hardier than Ramsdell Sweet, and Sweet June extends the apple region from Dubuque to Polk, to Pottawattamie county, while Talman Sweet may be grown from Allamakee to Webster, to Woodbury county. This map shows the relative hardiness of these five varieties.

On the next map we notice that Dominie covers very much the same area in the state that Ramsdell Sweet does. Jonathan and Benoni are of the same relative hardiness as indicated by the reports.

Ben Davis and Gano seem to be of equal hardiness. Gano, however, has not been so extensively planted as the Ben Davis, but the reports from it indicate that it will thrive in about the same territory as does that variety. These two sorts are reported as doing well as far north as Franklin and Clayton counties when topworked on hardy stocks. At the north the Ben Davis is defective in the body, or bole of the tree, and topworking is advantageous to it along its northern limits. Fameuse is of about the same degree of hardiness as the Talman Sweet, and is reported favorably on from Allamakee to Plymouth county, so it covers about three-fourths of the state. Lowell and Maiden Blush thrive in the southern part of the state from Louisa to Mills county. Red June from Jackson to Polk, to Monona county. Roman Stem and Fall Orange grow further north, extending from Clayton through Story to Woodbury. Utter is of the same relative hardiness as Talman and Fameuse.

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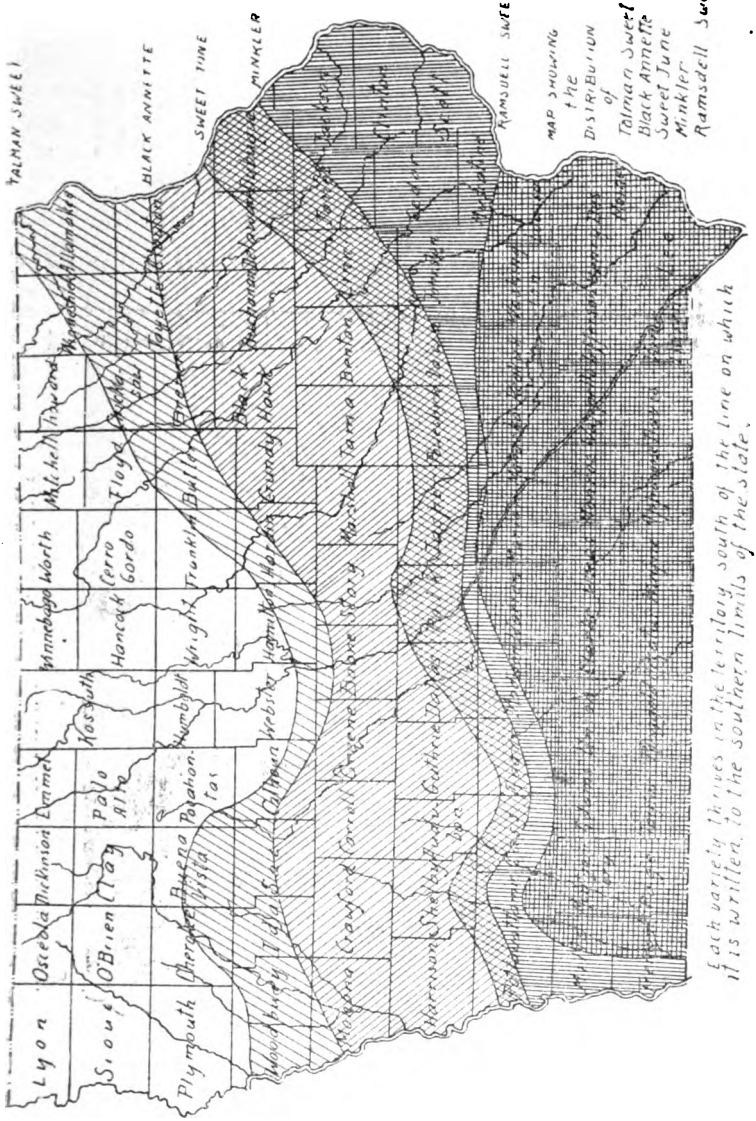
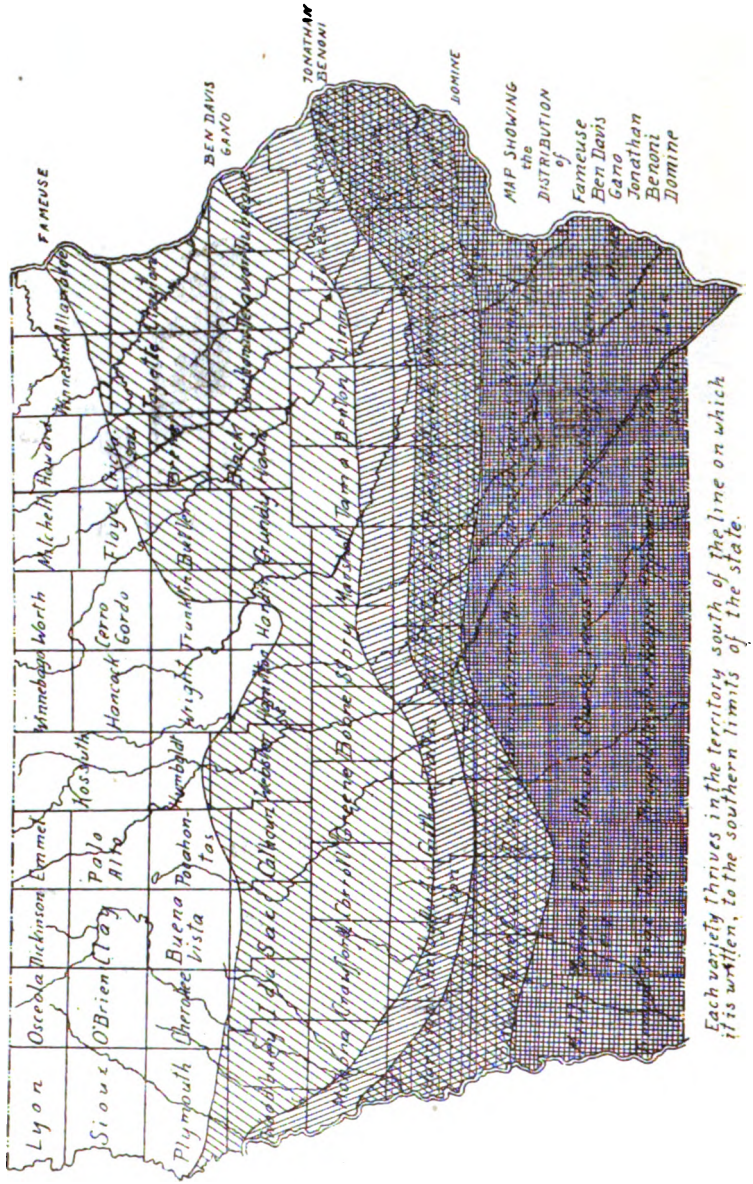

TALMAN SWEET
BLACK ANNETTE
SWEET JUNE
MINKLER
RAMSDELL SWEET
MAP SHOWING THE DISTRIBUTION OF
Talman Sweet
Black Annette
Sweet June
Minkler
Ramsdell Sweet
Each variety thrives in the territory south of the line on which it is written, to the southern limits of the State.
Lyon
Osceola
Dickinson
Emmet
Kossuth
Winnebago
Worth
Mitchell
Howard
Sioux
O'Brien
Clay
Palo Alto
Hancock
Cerro Gordo
Floyd
Chickasaw
Plymouth
Cherokee
Buena Vista
Pocahontas
Humboldt
Wright
Franklin
Butler
Black Hawk
Grundy
Hardin
Webster
Hamilton
Calhoun
Sac
Carroll
Greene
Boone
Story
Marshall
Tama
Benton
Monona
Crawford
Shelby
Audubon
Guthrie
Dallas
Harrison
Pottawattamie
Mills
Montgomery
Adams
Union
Clarke
Lucas
Monroe
Wapello
Jefferson
Henry
Louisa
Muscatine
Scott
Clinton
Jackson
Dubuque
Delaware
Buchanan
Black Hawk
Grundy
Tama
Benton
Linn
Jones
Clayton
Fayette
Allamakee
Winneshiek
Howard
Mitchell
Chickasaw
Floyd
Bremer
Butler
Grundy
Hardin



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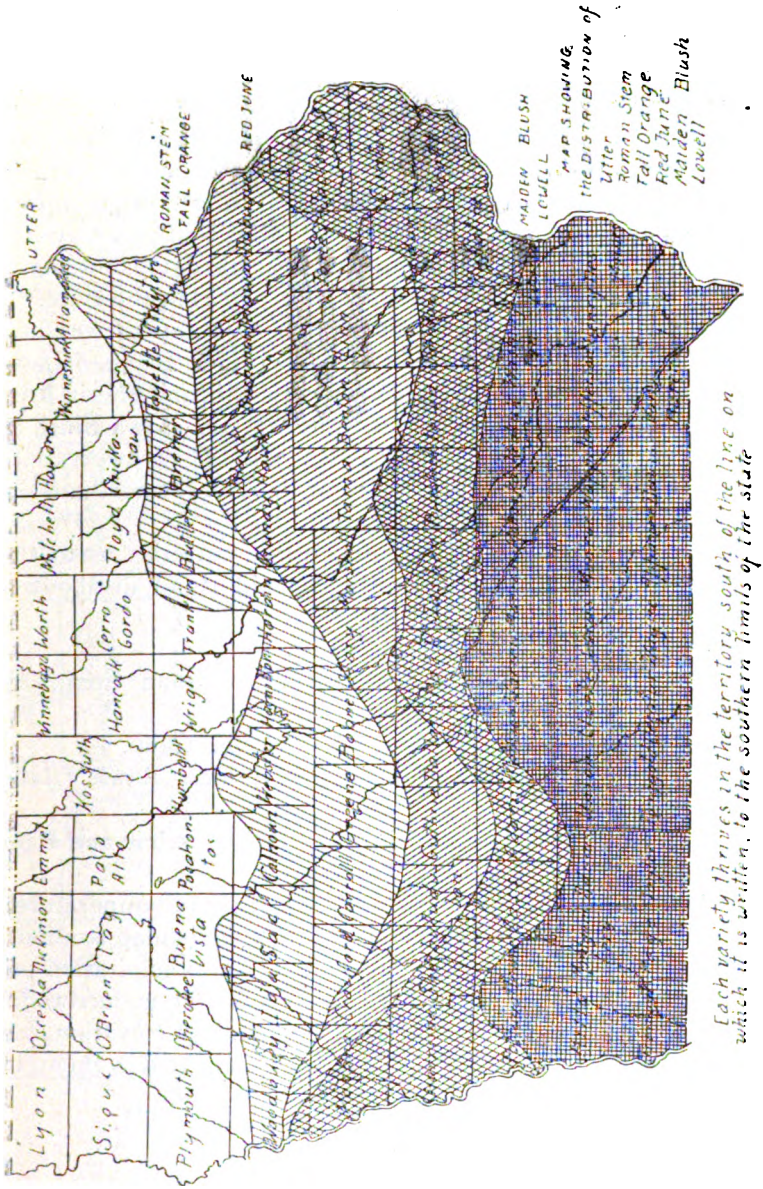

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You have probably noticed on this and the preceding maps, that the lines marking the limits of several varieties converge at Sioux City. This is owing to the fact that Sioux City has a relatively high temperature for a place so far north. Its mean temperature is only two-tenths of a degree less than Glenwood, a hundred miles further south, and if the variety is not seriously affected by the greater aridity of the atmosphere, it will do nearly as well at Sioux City as at Glenwood. A comparison of figures as shown on page 335, of the report for 1899, will be of interest in this connection. We only refer to it now, that you may study the situtation at your leisure, as much valuable data is there given relative to the climatic conditions of ten places in the state.

The last map on apples shows that the Winesap thrives in all the counties south of Louisa, Polk and Pottawattamie. Rawle's Janet and Grimes Golden extend further north, and Sheriff brings the apple zone up to the center of the state. Iowa Blush and Cole's Quince are hardier than the Sheriff. These two varieties are nearly the same in hardiness, their lines on the northern limit cross each other in Hamilton county.

If we were to group these twenty-three varieties as to their relative hardiness to each other they would stand in about the following order:

FIRST: Talman, Fameuse and Utter.

SECOND: Black Annette, Iowa Blush, Roman Stem, Fall Orange.

THIRD: Sweet June, Sheriff, Ben Davis and Gano.

FOURTH: Jonathan, Benoni, Grimes Golden, Rawle's Janet, Red June and Minkler.

FIFTH: Winesap, Maiden Blush, Lowell, Dominie and Ramsdell's Sweet.

We append a map showing the zones of mean temperature in the state for a period of six to forty years. This map studied in connection with the one on elevation, and on precipitation published in the last report, will help us to a better understanding of the condition to which plants are subjected by elevation, temperature and rainfall and the effect these have upon them, but we cannot enter into a discussion of that topic now.

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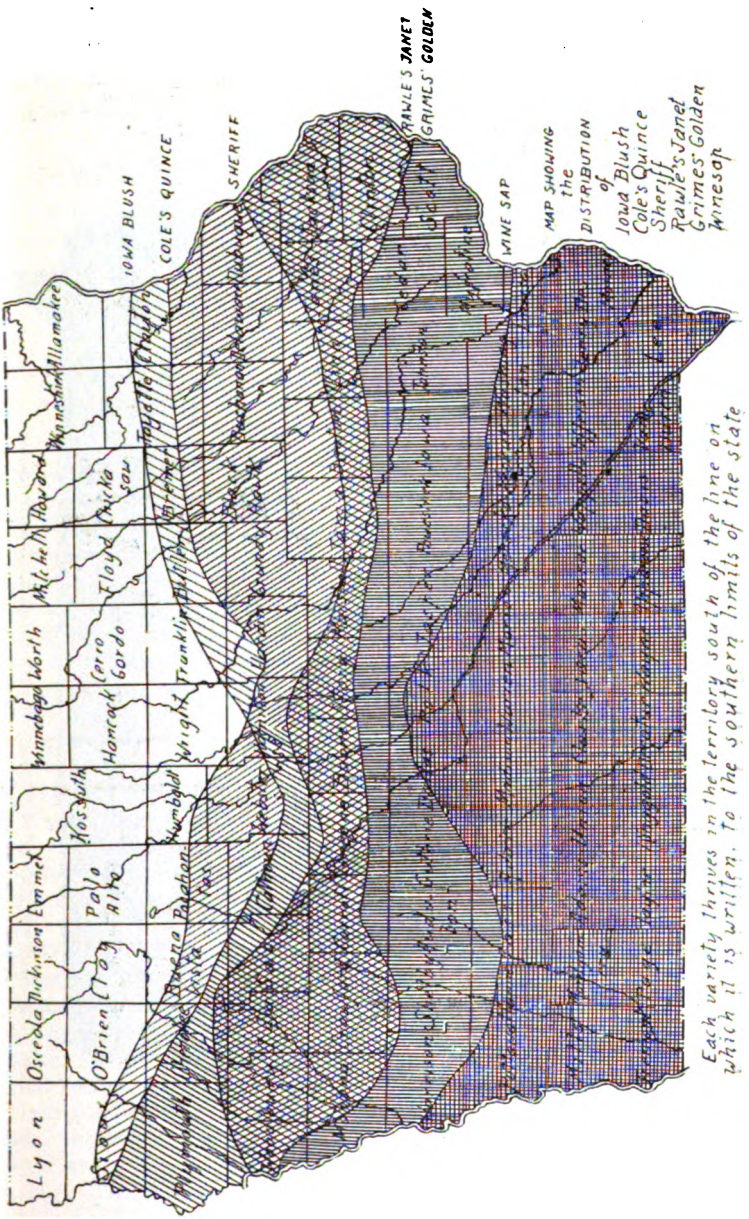
MAP SHOWING the DISTRIBUTION of Iowa Blush Cole's Quince Sheriff Rawle's Janet Grimes' Golden Winesap
IOWA BLUSH
COLE'S QUINCE
SHERIFF
RAWLE'S JANET
GRIMES' GOLDEN
WINE SAP
Each variety thrives in the territory south of the line on which it is written. to the southern limits of the state

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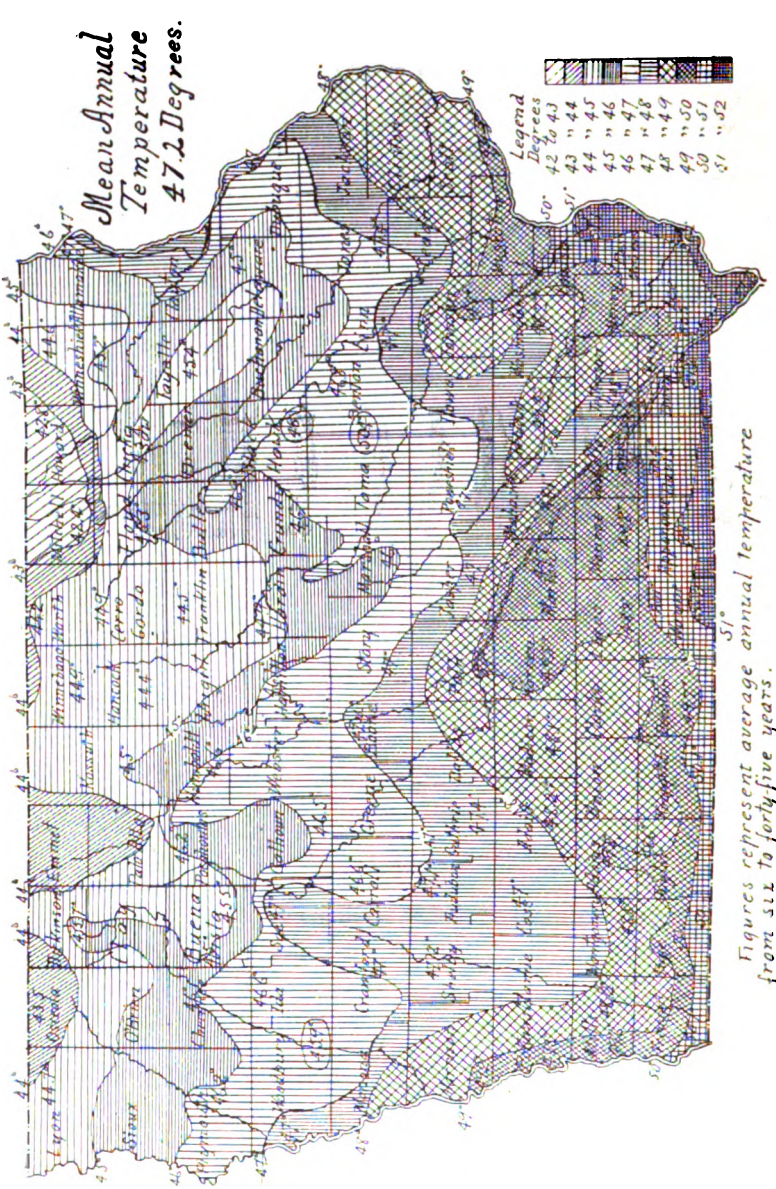

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WEDNESDAY, DECEMBER 12TH, 9 A. M.

Meeting called to order by the President.

THE PRESIDENT: We will now listen to a paper entitled, "New Varieties of Strawberries and Red Raspberries," by Geo. S. Bacon, of Des Moines.

SOME NEW STRAWBERRIES AND RED RASPBERRIES.

BY GEORGE S. BACON, DES MOINES.

More than half of the "home grown" strawberries sold in our markets are of three varieties, Bederwood, Crescent and Warfield. The Warfield when well grown is good enough, but the plant is one of the first to suffer from drouth, and, while productive, the fruit runs small after one or two pickings. The Crescent and Wood are also productive, but since the fruit is so poor and so soft it is now time they gave place to other well known and better varieties, and I will venture to name the Splendid and the Bisel as two strawberries that seem to be in every way more desirable. The plants are free from disease and very hardy. The fruit is good color, fine quality and is larger than any of the varieties first named, and with me the beds have been more productive of salable berries. The Wolverton is another berry of great merit. It does not make many plants, but they are strong and vigorous, the fruit large, firm, and of high quality, and with reasonable care a bed may be kept for a second or even a third crop still producing large, fine fruit. The Enhance among my neighbors has been the most productive of all strawberries. The fruit is irregular but finely colored, and its large size, high quality, and firmness, make it best for home market or distant shipments. Now, with me, these berries are in every way more satisfactory than Wood, Crescent and Warfield. I will add that among newer varieties the Morgan, Ridgway and Sample are very promising, but would not now recommend them for general planting.

"The Loudon is the only red raspberry on earth," is the emphatic claim made for it by Mr. Loudon, who introduced it and whose name it bears. If by that he meant to say that it was far superior to all other reds as a variety to plant for profit in the west, my own experience would fully justify his claim, but it requires rich soil and good cultivation. The plants of the Loudon are of short, stocky growth, and very hardy. They require close pruning. The fruiting canes must be cut back, leaving them not more than thirty inches high, then they throw out fruit buds from the ground up, and are able to sustain their great loads of fine fruit. The berry is a brighter red than the Cuthbert, firmer and fully its equal in size and quality. It is not a

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free plant maker and requires far less labor to keep the rows thinned for good fruiting than any other red variety. It withstands drouth well and last year yielded more fruit than any black raspberry on my place.

High authority in this state calls the Kenyon a better berry than the Loudon, and some eastern authorities claim that they are identical, but I have not found either statement correct. Compared with the Cuthbert the fruit of the Loudon is firmer and brighter in color, while the fruit of the Kenyon is softer and darker in color than the Cuthbert. The foliage of the canes of the Kenyon are darker than the Loudon and grow much taller and more slender. While the Loudon produces but few plants the Kenyon is a great plant maker, and is fully equal to the old Turner in that respect. When well cared for the Kenyon produces great crops of fruit, but it is too soft to ship and its quality is far below either Cuthbert or Loudon.

THE PRESIDENT: The paper is open for discussion, gentlemen.

W. A. BURNAP: What have you to say about the Clyde strawberry?

ANSWER: Well, in wet seasons it is rather soft.

MR. BURNAP: I will say that is the first unfavorable report I have had of the Clyde.

C. G. BLODGETT: I have an unfavorable report. My location is southeastern Iowa. I find that it is so long in ripening. The fruit stems are short, berry heavy and lies close to the ground. It is from two to five days ripening the first berries. With me it wasn't as productive as the Warfield, Crescent or Bederwood. I am trying the Lovett. The Warfield is the best standard I have.

B. F. FERRIS: Up in the north I consider the strawberry the second fruit. Apples take the first place, but after the apples come the strawberries; then the raspberries. These are the three leading fruits in the order named. I consider this a very important paper, coming from the source it does. I have arisen more to provoke discussion than to give any light. I will say that some of the varieties criticised by Capt. Bacon are popular with us. The Bederwood is very satisfactory; but we do not ship much fruit. It is the home market we want to supply. The very three varieties that we used to grow we grow yet. While the Bederwood produces small berries, it produces them after the others have pretty much given up the field. As to raspberries, I agree with the Captain, that the Loudon should take the first place for red raspberries.

MR. BURNAP: I would like to ask about the Columbian.

MR. BACON: I have no knowledge of it.

W. O. WILLARD: I have used it for several years. It is very liable to be killed out. There is one thing, if there is a foot of cane left, it will usually produce a good crop. It is very late, of

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course; comes into the market after the black berries are gone. It is too dark a color, but it is a good canning berry, I think.

P. F. KINNE: The Loudon is not coming up to my expectation. No one in my neighborhood is having any success with the Loudon. We have a local red raspberry that was brought in there by Mr. Calkins. He got it somewhere in the northern part of the state. He does'nt know any name for it, but has found a description in some old report that denominates it, Crimson Cluster, and it is the largest of any red raspberry I every saw and seems to be absolutely hardy. It grows medium size; it is stocky and bears wonderful crops of fruit. I never saw it until this season, and I think it promises to be something very valuable.

PROF. ROBERTSON, OF MINNESOTA: I would like a little information further, in regard to that Warfield. I would like to know if there is not a great deal of difference in the stock you get of it. With me, the Warfield is the most delightful berry we have in the garden. I visited a gentleman this last season who had it and did very good work with it. His berries were small, a characteristic which does not show in mine to any extent. There is nothing in our list that produces as well as the Warfield. I am informed that others have a similar experience in regard to the stock. I would like to know if there is not a great variation in the stock, of what is called the Warfield. We did not have anything that yielded as well or produced as nice berries.

A MEMBER: What were they fertilized with?

ANSWER: They were beside the Crescent and Bederwood.

C. G. BLODGETT: This Warfield I have been growing for eight or nine years. There are different numbers of the Warfield. There is a standard number one. The generally cultivated Warfield is number two. I have experienced the same trouble that this gentleman spoke of, of the knobby, poor berries; but the trouble was with the season and not the plants, because I have had excellent crops from the same plants and from the same stock. Some years, especially dry years, will effect the Warfield quicker than any other variety I know of.

B. SHONTZ: Did you ever try it on different soils?

ANSWER: Never, except on black prairie, but it is the yielder in my town. The Warfield will outsell anything a cent a quart. I can get more for the Warfield for canning purposes than for anything else. Going back to the Clyde, I will say that it is of fairly good quality and a good sized berry. The Bisel and

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Splendid I planted a year ago together, and so far as the plant growth is concerned, they have done remarkably well; too well in the last two months; so much so that I will have to fight plants next spring. I shall cultivate them.

MR. BACON: I think this question of trouble with the Warfield is altogether a question of fertilization. The Bederwood is as good a fertilizer as the Warfield can have; yet sometimes the Bederwood will not fertilize perfectly. Some years they have grown different, as to the time of coming out. One will come a little earlier one year, and the other a little earlier in another year. The Warfield has got to be well fertilized. It does not fertilize itself at all; it is perfectly helpless. If you do not get a fertilizing plant by the side of it, of course we cannot get good berries.

PROFESSOR ROBERTSON: I only desire to make a little further explanation. Mine was only the second crop of the Warfield and they received no artificial water whatever. Of course, our ground was well mulched; but even this season, in the second crop, this Warfield, having beside it the Lovett, Crescent and Bederwood, it far outstripped any of these, even this season, on a second crop.

THE PRESIDENT: We will next listen to a paper entitled, "Plums for Iowa," by M. J. Wragg, of Waukee.

PLUMS FOR IOWA.

BY M. J. WRAGG, WAUKEE.

If one should take a glance at the different fruit maps of Iowa, prepared by our secretary, showing the amount of plantings of the different varieties of fruit for the past ten years of apple, cherry, pear, plum, etc., you would note this one fact that the plum occupies a prominent place as a fruit which is varified by the great number of trees that have been planted in the past ten years, as shown by these maps, we should give it second rank for this state, placing nothing but the apple before it. The improvement of the plum during the past twenty years in Iowa has been simply wonderful, which is attested by the great number of new varieties that have been brought out by our progressive horticulturists. In no branch of pomology has the improvement and developement been greater than in the classifying, naming and introducing of our best native plums, besides the introduction of many foreign varieties. It is also during this era that the Japanese plums have been introduced into this country, not only adding a new family *(P. Triflora)* to our already large pomology, but giving us a new race whereby the possibilities are very great in the way of breeding up new fruits from crosses of these on some of our best American sorts.

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Stop and take a look at a soil map of Iowa. Take into account the different altitude found in different parts of the state. Note the different soils that are found at different points in our state, from Keokuk in the southeast to the high altitudes in the northwest; from the Kansan drift in the southwest, with its loess deposits, to the conditions in the northeast Iowa; one is led to exclaim,—"Oh! What an empire."

While Iowa is the home of the hardiest and most prolific family of plums (*Prunus Americana*) known; which have by generations of selection, and cross fertilization been developed here in this great Mississippi Valley, with all the requirements adapted to both soil and climatic conditions. I am a great lover of this family of plums, and believe when it comes to quality that it has not a peer even in the much lauded Japan sorts. It would be folly to claim that the introduced varieties of plums from Europe and the Orient were a failure in our state. Our fruit markets during the plum season would belie such a statement. The original parents of most of the cultivated plums of the gradens which were known and planted prior to '80, came from the original parents of the cultivated plums of south Asia and Europe. It had to be naturalized in this country and from the crosses and new varieties produced it is found admirably suited for planting in several points in our state.

We are confident from our observation in the last year that the European varieties of plum (*Prunus domestica*) have not had the attention that they deserve by our fruit planters. I know of no plum for southeastern Iowa, taking a territory including Keokuk county on the north, following up the Des Moines River to near Des Moines, retracing back on the west bank, taking in about twenty-five miles adjacent about Des Moines River until you come to Monroe county and then in a southernly direction taking in Appanoose and Van Buren counties on the south. Here is a large extent of territory over which this family of plums are doing well and not only here but at points over Adair, Cass and other counties in the southwest. We are having wonderful reports of the fruitage and good behavior of such varieties as Lombard, German Prune, Tatge, Deaton, etc., and will find an increasing demand over a large portion of southeastern Iowa for the European plums. Our opinion is that the Japanese plums will prove of great value over a limited area of south and southwestern Iowa. They have proved their ability to resist the Black Knot which is so destructive to the European type of plums. While it is decidely susceptible to rot, with the bad fault of early blooming, yet aside from this I think the future is bright and encouraging for the planting of the Japs. The varieties of the Japanese sorts of plums, Abundance, Wickson, and Burbank are giving the best results in this state. They are, all three, very productive. The Burbank in my opinion is the best of the class.

We are convinced that on certain soils in Iowa that varieties imported from South Russia by our Agricultural College will possibly find soils and conditions so congenial that they will be planted and be found productive at many points. We were surprised during the past fall in the markets of this city to find plums, both blue and yellow, of varieties like Merunka, Yellow Moldavka, and a few other sorts, grown by our friend Mr. Arthur, just east of this city. He tells me that they are an abundant bearer of first-class fruit, which command the best prices on this market. But when it comes to plums for the masses we say, "American plums for America." We have

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native species of plums that when grown in their proper areas are capable of supplying plums for every farmer and laborers' garden throughout this broad state of ours. The American plum is hardy, both in tree and bud, and the past winters of '98 and '99, when we had conditions throughout Iowa that lowered the vitality and took out our foreign varieties, yet the pure Americana has stood it all. It may be safely said that no other fruit tree in Iowa has so wide a climatic range as our native plum, and this is not only true of Iowa, but of the whole Mississippi valley. We know of no fruit that can be depended upon and yield more bushels of fruit per acre than our best native sorts of plums. As a family of plums the Americana is variable, having those of high quality with thin skin, which are adapted to home markets, and those of thicker skin, which will stand shipping. We have the free stone and the cling stone, the yellow and red, the early and late, and possibly at the risk of incurring a little ridicule from you gentlemen, I will venture my opinion on the quality of the plum, and will state that for eating from the hand and for culinary purposes, that I have found the richest and most delicious varieties of plums among our native sorts.

I would not want to prejudice any against the Russian, European, and Japanese plums. Let all grow them that can, remembering that the best is none too good and the "survival of the fittest" is what we want brought to the front. The most reliable sorts of the Americanas for planting, generally over the state, are Desoto, Forest Garden, Hawkeye, Rockford, Stoddard, Wolf, Wyant, etc. There are also varieties of the American family known as the "Hortulana type" that are in many places in the state considered standards of excellence and worthy of cultivation. The best varieties of this type are the Wild Goose, Downing, Pooles Pride, Miner, etc. With our many trial stations over the state, where are tested such varieties as Beatty, Brittle Wood, Free Silver, etc., it will be but a short time until we will have varieties to fill all seasons from early to late, and which in size will rival their foreign cousins. I hear a voice say, plums are very uncertain in setting fruit. This may be true, but the greater part of this uncertainty seems to be, lack of proper cross pollizination. To secure the best results, different varieties of the best plums should be planted together, giving them what I term forest conditions, and if you have not the room to plant of the different sorts, would do this: Top graft into your trees varieties that are strong pollonizers. Among our American sorts nature has provided by her natural adaptations for this cross pollonization of the plum, and one has but to plant a few varieties of these to be convinced that nature has been wonderfully prolific along these lines.

The plum is, possible, as free from disease as any one family of fruit that we have. The great draw back in growing the "Domestica" varieties in the past has been Black Knot. It has been proven that this disease is a parasitic plant which causes the developing of this disease, and while it is very destructive to the growing of this variety, yet with attention it is easily eradicated from the plum orchard. It is a disease that should be dealt with immediately so that the spores will not be spread, and burning is the best remedy. Our observation leads us to believe that the Japanese sorts are as free from disease as any. The most common disease that attacks our native sorts is plum pocket, which no doubt is produced by some fungus parasite. We have known it to take the complete crop of some varieties.

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The Cheney is the variety most susceptible to this disease that we know of. The curculio and gouger are the plums native insect foes and to be properly combatted requires skill and strict attention to business.

As to the best kind of a plum tree to plant in Iowa, we have always said, plant only those that have been grown on native stocks, and the winter of '98 has fully convinced us that we were right on this one thing. Over the state at the present time there will be found plum orchards that are showing decline for the past two years, and we venture the assertion that if you will examine the roots of these trees you will find they are not on the above stock, but are on Marianna, Myrobolan, St. Julian, or some of the commercial stocks used. It is as essential to provide a tree with the proper kind of a root to thrive and be productive on, as it is in looking to the proper foundations for building any of our great structures of architecture. In fact I fear we do not put stress enough on the stocks that are used for our different fruits trees.

ELMER REEVES: I think there was one important statement made we should think of. He said it was a good plan, in some cases, to topgraft a plum tree with some proper variety, in order that we might get proper pollination of the blossoms. Supposing I don't know any thing about the different varieties—I want to have planted a lot of plums and I want to have them topgrafted. What shall I graft them into? I don't want to have any guess work about this.

THE PRESIDENT: I believe Professor Craig gave us a table last year and I believe if Mr. Reeves will refer to that he will find the desired varieties.

THE SECRETARY: That is one of the very things I have been trying to do. I have sent you letters and have quite a compilation of that sort of material on hand. Perhaps next year, it will be ready to go out in fair shape. I have now on hand reports covering perhaps thirty-five or more leading varieties of our American plums, giving the dates of their blooming period, and just as soon as we get sufficient reports the table will be published. I hope to have this completed soon.

C. L. WATROUS: There is a bulletin published by the Vermont experiment station, that is far more extensive and complete than anything else I have ever seen. Mr. Reeves can refer to that and get the Bulletin published by Professor Craig and with those two he has the very best information that any of us have. If I should tell which ones bloom with the Miner, on my place, and would prove good pollinators, it does not follow that those would be best for Mr. Reeves. That is one thing we will have to look at. If a man can tell just what happens on his place, a man seventy-five miles from there, north or south, is by no means

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certain that the same thing is going to happen or follow on his place.

MR. REEVES: I think the Captain has got at the meat of the whole matter. Now, having studied the bulletins referred to myself, for years, I know this to be a fact: one year two certain varieties may bloom together; the next year they may bloom widely apart. That will also extend to individual things of the same variety; so that it is not alone depending on the distance one may live away, but the same ground and local conditions may cause a variation. I shall do just as the Captain suggested, but I want to say, that we cannot put down any definite rules in regard to this matter.

WILLIAM LANGHAM: I am much pleased with the paper. I wish our secretary in the near future would prepare a soil map and a plum map, on the lines he has prepared the other maps, so that we can see the plum province on it. Of course, up with us, the Domesticas do not do very well. I would like to have him mark on that map where the Domesticas do well, and where the Japanese do well, and so on, with each great family of plums, that we may know whether it is reasonably safe to plant certain kinds. I had seven or eight Miner plum trees, ten or twelve years old, that were habitually barren. I had a man come and put into each one of those trees, I think they was Wyant grafts. The next year they seemed to be blooming about the same time and I had an abundance of Miner plums and have had every year since, when there was a plum crop.

W. M. BOMBERGER: I have set a number of Wyants on the Miner. There is an agreeable affinity between those two varieties. The growth is splendid. It makes Miners every year. Just another illustration of doing just a little bit of experimental work.

A MEMBER: Is it not a fact that the De Soto always blooms very full?

A MEMBER: I have topped the De Soto and the Miner considerably and with very good success. But if any of you have the Weaver—it is a nonfertilizing sort. The De Soto and the Weaver top has proven very successful with me. The Weaver, as it stood isolated, I never had a quart of fruit from it; but after putting the De Soto in the top, I never failed to get a good crop.

MR. BACON: One point I wish to speak about with regard to the paper on plums, which seemed to me more important than any other one, and that is the root on which the plum is propagated. The best root in the world to propagate a wild plum

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on would be a wild root. The best plum we can get, would be a plum on its own root. If I were planting another cherry orchard, I would not plant, except on their own roots. I have a few Wragg cherries on their own roots. They are new trees yet; only five years next spring. They are much stronger than any other Wragg cherry tree I have in my orchard. I have some on other roots, but they do not begin to compare with those on their own roots. I have an Ostheim also on its own roots; it grows well and does well.

A MEMBER: Is the Otheim your best cherry?

ANSWER: It is the best quality I have.

MR. WATROUS; In regard to the matter of truly choice cherries —I have on my place and have had for a good many years, some trees of the Wragg, obtained from Mr. Wragg in his lifetime. They have borne and fruited all right; they are entirely satisfactory. I have also a row of English Morello root grafted and they have borne and brought me more money than anything else I have had.

MR. BURNAP: We ought to be very careful about telling our own experience. I want to emphasize the warning in the paper, regarding putting plums on anything else than their own roots. I planted an orchard of plums, expecting to reach great results. Unfortunately, they were not on their own root. Whatever you may do in the south, southeastern or southwestern part of the state, I am satisfied, in the northern part of the state, it is absolutely useless to plant plums on anything else but own roots.

MR. WRAGG: If I understand Mr. Bacon, in referring to a tree on its own roots, he don't mean that the Hawkeye is any better by being grown from root cuttings on a Hawkeye tree. You would call them both on their own roots. It is impracticable for nurserymen in the north and west to grow trees, and offer them for sale on their own roots, grown from stolons or propagated from cuttings. As soon as it were found to be a good thing, they could not keep up with the demand. I claim that the Hawkeye, grown and budded on a seedling of a Hawkeye or Wyant is just as good as a grown sucker taken from the original Hawkeye tree.

MR. REEVES: A few years ago, at the State Fair, Captain Speer brought a collection of plums there which varied very much in size and appearance. He had plums all the way from the size of a small marble up to a large De Soto. He had planted De Soto seeds and grafted on De Soto. I went to his trees and looked at them and they were all De Sotos. The fruit varied so that

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you would not recognize them as the same plum at all. Our plum grafted on any kind of root is so variable. While the Americana is the only root I would use, it is not satisfactory. If we can get them absolutely on their own roots, that is the only way we can get them right.

SILAS WILSON: I want to say a word from the nurseryman's standpoint. Here is a great question. The nurserymen in Iowa, as well as elsewhere, are in the business for their bread and butter. Now, if we undertake to propagate plums or cherries on their own roots, we are left holding the sack. Our patrons will not patronize us at all. I bought twenty-five De Sotos in northern Iowa on their own roots. When I got them they didn't have any more roots than these two fingers. With good care I had five of them live. I got them from Mr. Terry; they were Hawkeye's on their own root. I gave them all the attention I knew how; they were utterly rootless. And this is a thing we don't want to overlook.

MR. BOMBERGER: My experience with the De Soto is, that it is the finest thing in the plum line, of any kind that can be grown in Iowa, on its own root. Regarding roots on other varieties, I would say, I have 230 Wyants on Marianna. I cannot see a particle of difference between the fruit of that section and the two original Wyants set out some thirteen or fourteen years ago. So I think you are safe on our soil in planting Wyant on the Marianna root. As to the Hawkeye, Mr. Terry says, it fruits better on its own root, but on our soil the Hawkeye on its own root is a shy bearer.

MR. WILSON: In regard to the cherry, the best cherry trees I have ever seen East or West, the largest and most productive, were on Mazzard root. I had an English Morello cherry that stood twenty-four years. Father Clarkson, who used to be editor of the agricultural department of the *Register*, used to come to Atlantic and he always admired my trees. They were English Morello's and propagated on Mazzard stock. I am led to believe, by my experience in Cass county, there is no root equal to the Mazzard for dark cherry.

A MEMBER: I would like to ask Mr. Wilson how this English Morello came through the bad winter on their own roots?

ANSWER: They were pretty old.

QUESTION: Did you have any young trees on the Mazzard?

ANSWER: I lost my younger cherry orchard; that is, I lost so much of it that I turned in and dug the rest up and set out a new

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one. There wasn't enough left to pay me to maintain this same ground in pasture. I had a few rows: where they were protected by grass, they were all right. Many of my Domestica plums went out. The Americana plums on the Americana root went out; the De Soto's and Hawkeye's were sickly. I want to say a word in regard the Marianna. I was supprised to see its recuperative powers in the test winter a few years ago. I supposed they were killed outright, but they have grown strong and vigorous; in fact, they went through much better than the De Soto and Hawkeye that were on the Marianna roots. The Milton and Charles Downing are not considered hardy. But the Marianna has the ability to recover from a winter like that better than anything I have on my place.

THE PRESIDENT: The next paper is entitled, "Mistakes in Planting," by W. F. Steigerwalt, of Carroll.

MISTAKES IN PLANTING.

BY W. F. STEIGERWALT, CARROLL.

The lady whose inelegant remark, that her husband's back sights were a great deal better than his fore sights, may have contained more facts than poetry, will apply with equal force to every nurseryman and tree planter. We all can truthfully say; had we known twenty, thirty or forty years ago what we know now about horticulture we would have saved a great deal of time, money and hard labor. Still we do not know it all yet. We will continue making mistakes in planting as long as strength holds out. Most of our mistakes were made by the limited knowledge of the subject; by wrong advice, and by unavoidable circumstances. Persons who were born and raised in the east where timber of all kinds (including the evergreens) were native, where all varieties of fruit were plentiful, even to the lucious huckleberry on the rocky sides of hills and mountains, upon their arrival on the bleak prairies soon put their thoughts to the planting of trees. The planting was frequently done before the soil was properly subdued and prepared for the plants. The planting was done hastely and indiscriminately. For the protection of the home from the fierce winds the quick growing Cottonwood and Lombardy Poplar was sought after. The next better was the Soft-maple, Boxelder and Gray-willow for hedges; all of which are now being removed with a great deal of hard labor in the older settled communities on account of being a source of danger to life and property in heavy storms. Mistakes are made in planting these trees and hedges on lines between neighbors, in a few year they become the source of injury to crops on either side, bad blood between neighbors, and frequently winds up in law suits. The Cottonwood grows quickly when planted a single row or double row running north and south. If rows are planted the center rows are comparatively worthless, the wood will only make fuel for the kitchen

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stove, and when the bloom falls like a mild snow storm all doors and windows have to be kept closed. The Lombardy Poplar is always full of dead limbs and has nothing to recommend it. The boxelder, maple, ash, etc., when growing in the proximity of a berry patch will manage to scatter their seeds among the canes and the sprouts becomes a nuisance.

The Catalpa has none of the above objections; it is a slow growing tree but it never commits a nuisance, the wood is enduring for fence posts and valuable and ornamental for finishing purposes. I have in mind a half mile row of Catalpa trees along the public road, the trees are twenty feet apart and from six to eight inches in diameter, they are fine when in foliage and a beauty when in bloom, they answer the purpose as fence posts and are apparantly no damage to field crops.

It is a mistake that the Butternut and Black-walnut are not planted in place of worthless trees, they are just as ornamental as most shade trees and when in bearing are a source of profit and a pleasure for the boys and girls. The Wild-olive is a tree that should be on every farm, not only on the lawn but along the road sides, the tree is apparantly as hardy as the oak, the drought of 1894 on high ground had no effect on it, neither the severe cold of 33 below zero in February 1899. There is no shrub nor rose that is as fragrant as the olive when in full bloom,—what a joy to the passers by it would be if there were only one tree every hundred feet along our public highways.

I have not mentioned any of the evergreens for planting. My experience with evergreens has been a perfect failure. Of several hundred trees planted only one single tree remains. In the fruit line our mistakes in planting have been manifold. First the planting of eastern varieties not hardy on prairie soil, and trees brought too far north are more liable to winter kill while trees brought too far south will more or less sun scald. Those who have done any considerable planting of fruit trees have planted too many early and mid-summer varieties. In ordinary seasons the markets are so over stocked that the fruit become a drug in the market and prices run so low that it does not pay for the time to market them, these mistakes have been made by the recommendations of the tree agents, or by nurserymen substituting for what had not been ordered by the agent. There are just as honest tree agents as nurserymen. In my own experience I had but one bill of trees come all true to name. I ordered direct from the nurseryman and only a single variety and I told the man for Gods sake not to send me anything else. It was the Black Annette apple. It is a perfect disappointment both in tree and fruit.

For family use only a few trees of varieties that follow each other in maturing should be planted, half of the orchard should be planted with winter or late keeping varieties, for such the prices are always remunerative. In the plum line the opposite is preferable, the early varieties always bring the best prices.

Mistakes are frequently made by planters in planting apple orchards on south slopes instead of north slopes, and plums on high or uphill instead of second bottom or creek or river bottom, and cherries on sandy soil instead of clay sub-soil. And all planting in this part of the great Northwest should be done in the spring and not in the fall, as I was recommended in an Ohio paper. The planting of small fruits, and especially the strawberry, have to be studied on these lines as to soil and location. All tree plants do

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best where found naturally, some can be acclimated to a certain extent but the process is slow. I truly believe that certain varieties of apples that are doing well in the central part of the state will do fairly well in the northern part and in Minnesota in the course of time when the soil becomes older.

THE PRESIDENT: We will now listen to a paper entitled, "Notes on New Fruits," by N. K. Fluke, of Davenport.

NOTES ON NEW FRUITS.

BY N. K. FLUKE, DAVENPORT.

Believing that our native crab might be the progenitor of a new race of fruits, by using one of its variations or sports as a parent, by crossing it with our cultivated apple, thus breaking up their racial type more completely which nature had begun, and by so doing introduce new elements of variation, then by selecting and planting their seeds, we could, in the near future, grow an apple better suited to our intercontinental climate. Many doubts have been expressed as to the possibility, or good, of any results from this line of work, and some persons, by many considered well versed in horticultural lore, said the cross is too violent, it could not be done. The Soulard, and the race or species it represents, is very difficult to cross with our cultivated apple, while the sports of this species, as the Mathews, Mercer, and others, may and some do cross quite readily. Is it a member of a district race or species, or not? Dr. Bailey in his book on the "Evolution of Our Native Fruits," says. "In my first critical study of the Soulard crab I became convinced that it represented a distinct natural species," and later on in his work he says: "I now confess to a belief that it is not, but a hybrid between *Pyrus Iowensis* and *Pyrus Malus*." I believe his first decision was right and that it is a representative of a distinct natural species, scattered as it is all over the middle western states. I have seven different crab trees now growing from grafts obtained from Missouri, Illinois and Iowa, of the Soulard type, they show very little difference in any respect, and some of them were taken from a natural crab thicket. Mr. D. B. Wier, a veteran fruit grower of Illinois, many years ago in writing of the Soulard, also said that he believes it to be a variety of the wild crab of the west.

Ten years ago, having trees in bloom of the Mercer county crab, which is no doubt a natural variation of the Soulard type, and by no means a hybrid of the *Pyrus Malus*, because it was a large tree and was found growing in the crab thicket far removed from any cultivated fruit, I pollenized its blossoms with pollen of Ben Davis, Duchess, Jonathan and Maiden Blush. I used it all together as the maternal parent, so that no question could ever come up, that the resulting trees were not crossed, should much varlation or improvement follow. For five years the seedlings were growing on a small lot, and transplanted twice, they have not made the growth they would have done under better conditions, and have not fruited. Some grafts, however, put on other trees have shown a few specimens. No. 27 fruited last year, is yellow in color, about like a medium sized Maiden Blush, season the first of September, a fairly good eating apple. Those fruiting this summer were all

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blown off by a big storm in August, consequently can't say as to their quality. No. 67, large, 8½ by 9¼ inches. No. 18, medium size, short stem, faintly striped with red. No. 17, small, quite red shading into yellow. No. 78, large, green, russet around the stem. No. 63, green, large, much wilted when found. Three or four years ago I sent Mr. Patten, of Charles City, scions of Nos. 110, 35, 88, 28, 10, 8, 1, and 31- He reports to me that three of them fruited this year.

While many of these fruits may have much of the acridness of the mother they show in other ways characteristics derived from the other parents, notably in trees, their leaves, and manner of growth. Many of us may never live to see any valuable results from this line of work, but it should be carried forward, and in the time that is sure to come, it will prove of value to others, after we are off the stage of action.

At the time, previously spoken of, I grew about fifty native plums, crosses of Weaver on the De Soto, and some from selected seeds. Having sold my farm when they were a year old, I grew them to planting size, and gave them to neighbors to fruit. All have shown fruit in the last two years. There are several of them equal to the best now in cultivation, and among the number there are eight free-stones, all yellow in color. Descriptions given are by Professor Craig of two sent to him: "Alpha-Americana; size large, oval, truncate at base; color clear yellow mottled with light red, overlaid with lilfac blush, sature clearly defined, flesh yellow, fairly firm and meaty, quality medium; season September 23rd; stone medium size, flat like Weaver, entirely free; parentage De Soto pollinated with Weaver. Remarks—A good strain to develop."

Davenport Americana; form regular, oval, sometimes conical, sometimes flattened laterly, size 1½ by 1⅜ by 1¼ inches, apex rounded, cavity very small; sature a faint line, surface smooth; color, clear yellow with faint pink blush; flesh deep yellow, firm; dots none, skin very thin, nonastringent; stone small, ovate, free; flavor pleasant sugar sweet, nonpruniose; quality best. Remarks—A handsome yellow free-stone, without acidity about the stone or astringency in skin, decidedly valuable. From seed of De Soto, originated under cultivation by Mr. Fluke, not introduced. Two other free-stones failed to reach him that were sent this fall—Betta No. 4 and Gamma No. 6, the latter larger and the equal in every respect to the Davenport. Betta a little smaller, both almost immune from rot and very late ripening. One of our leading plum growers to whom was given these two original trees, is propagating them to plant for market purposes.

A few years ago I was growing small fruits for market, and wishing to get a good large blackberry, that would be easier to cover than the Snyder and Ancient Briton, I pollenized blossoms of the Snyder, Ancient Briton, Erie, Wilson's Early, and a seedling of the latter, which I had grown, with pollen of the Lucretia dewberry. What few seeds of the Snyder that were saved failed to grow. Fifty of these blackberry seedlings, after growing them the first year, were planted out eight feet a part each way for fruiting, three of this number were like the dewberry in growth, never got off the ground, one of them a very strong grower, the other two very weak in growth, didn't live to bear, the fruit of the first mentioned was small and worthless; the other plants varied much in growth, from the dewberry to the strong growers, as Erie and Briton. After fruiting I selected twelve of the

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number for further trial and destroyed all the others, those saved were intermediate in growth, growing up more or less strong about two feet in height then growing off from ten to twenty feet and tipping like the dewberry. They were taken up in the fall, and all cut up into root cuttings, and after growing a year were planted in rows twelve feet apart and four feet in the row. They made fine growth that summer, but the following hard winter, three years ago, covered as they were with soil, and on clear ground in an exposed situation all the roots were killed six to ten inches deep; all made a small growth from the deepest roots, and made a little fruit the past summer and an exceeding strong growth. Most of these numbers have fruit with large drupelets and large berry, not long as the Lucretia but round as the Erie or Wilson. I think none of them will prove hardy enough to grow here without covering in winter. I hope I will be able to report more fully as to their value as fruiting plants.

Mr. Fluke after concluding the reading of his paper, exhibited to the members of the society some varieties of the growing wood which he had brought with him, of blackberry and dewberry hybrids.

WEDNESDAY AFTERNOON SESSION.

Meeting called to order by the President.

THE PRESIDENT: The first thing on the program is a paper entitled, "Some of the Newer Varieties of Apples and Pears," by M. J. Graham.

SOME OF THE NEWER VARIETIES OF APPLES AND PEARS.

BY M. J. GRAHAM, ADEL.

The fact that such excellent apples as the Jonathan and Grimes Golden, and the well known Bartlett pear were at one time new, and planted on probation, as it were, leads the progressive fruit grower to plant many of the new varieties that are constantly being introduced, hoping to find some that will be an improvement over the old ones in quality, hardness and general adaptability to our climate. With this end in view I have planted many of the varieties introduced in recent years, and fruited the following named kinds the past season:

Colton. Large, round, green with slight blush. Ripens just before Yellow Transparent, and is of better quality.

Banana. Tree vigorous, healthy and entirely hardy. Fruit large, light yellow, with red blush. Flesh fine, sub-acid, with a distinct banana flavor. Unquestionably one of the finest apples yet introduced.

Beach, or Apple of Commerce. Fruited on top-grafts only, and was not up to my expectation in size and appearance. Not tested as to quality.

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Reagan, or Black Ben Davis. Tree resembles the old Ben Davis, but the fruit is entirely distinct, more like Jonathan in shape, and very dark red in color. An attractive apple for market.

Oliver Red, or Senator. Tree of strong growth. Not yet fruited, but regarded as a promising variety.

Arkansas, or Mammoth Black Twig. Closely resembles Winesap in fruit, but tree is of more vigorous habit.

Arkansas Beauty. Is a large, light red apple, of good quality, ripening about with the Jonathan.

Springdale. Is of medium size, very dark red, and evidently a very late keeper, of moderate quality.

The six varieties last above named originated in Arkansas, yet they are entirely hardy here and were not injured in the tops by the severe cold in February, 1899, and are free from blight.

Pears.—The Mendenhall gave the first ripe specimens July 5th. Fruit small, pyriform, color yellow; much better in quality than Early Harvest. Not introduced, but would have some value for home use.

Koonce. Ripe July 15th, medium size, green with red blush; juicy and very good. Desirable for home use or market.

Lexington. New, originated in Kentucky. Hardy and free from blight. Fruit resembles Bartlett, but ripens two weeks earlier.

Vermont Beauty. Vigorous and hardy. Fruit medium in size, and excellent in quality.

Worden Seckel. A seedling of the old Seckel, equal in quality and double in size. Originated by Schuyler Worden, of Worden grape fame, and should be generally planted.

Mongolian Snow. Resembles Kieffer so closely in both tree and fruit that I am unable to distinguish any difference in the two varieties.

Lincoln Coreless. Proves to be the old Pound Pear "born again."

THE PRESIDENT: You have heard this valuable paper, gentlemen, and it is now open for discussion.

C. L. WATROUS: How many of these varieties are under restrictions, any of them?

ANSWER: No sir; I think not.

H. W. LATHROP: I do not know how many years this society has been paying premiums for seedling apples. The question has been raised in my mind whether we have been wasting money on that subject. We have paid premiums and let the seedling apples go to sleep, pass out of notice. I do not know that the society is offering any premiums this year.

THE SECRETARY: Yes sir; it is.

MR. LATHROP: Now, we know, some of us at least, that there have been valuable apples presented here and premiums paid on them. I have raised two valuable apples. One, I am sorry to say has gone out because it was top-worked; it was a seedling of the White Winter Pearmain.

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W. S. FULTZ: I have got that apple. I have a record of it.

QUESTION; You have the apples fruiting?

MR. FULTZ: They will fruit in a year or two from now.

MR. LATHROP: You will find it very much the shape of the White Winter Pearmain, but it has a flavor superior to it. I say that and speak advisedly. I have in my orchard a seedling striped Rambo. It is a better apple than the striped Rambo. If I had the old Irishman that sold apples on the Iowa City bank corner here, he would swear on a double oath it was the best apple he ever sold. I have raised it from the top of the trees—by the way, they are going wrong now. It is an old tree; it must be forty-five years old. I think the originator of the tree has got some young trees growing. I don't know but it is a little earlier apple than its parent, the striped Rambo. It is a little different in shape and very much the same in color.

A MEMBER: It is called the Newport.

MR. WATROUS: I would like to have a few of them and I would top-graft them.

MR. LATHROP: I will furnish you some of the Rambo if Mr. Fultz will furnish you the other.

W. A. BURNAP: While, of course, it may not have paid you gentlemen in southwestern and southeastern Iowa to pay premiums on seedling apples, I want to take a little issue with our friend and assure him it has paid us in northern Iowa. When he says there has not a seedling that has gone on the list of our state, I can assure you there is one, and that is Patten's Greening. It has gone into the Wisconsin society; the Minnesota society; it has gone up into the Red River country, clear up to Crookston where it stands well. If we havn't got another single thing in the State of Iowa, from a premium offer, it has well repaid the the society.

MR. LATHROP: What other apple than Patten's Greening is on our fruit list as a seedling? I would inquire whether Patten's Greening has ever taken a premium here as a seedling apple.

MR. BURNAP: The Patten's Greening is on the Minnesota list.

MR. LATHROP: Now, there is an apple called the University apple, originated by Mr. Patten. A Minnesota man came down here and offered him $750,00 for that tree. That is what Minnesota is doing ahead of Iowa. Some man here should have added another $50.00 and kept it here in the state; but Mr. Patten got a good price and he is like the rest of us; he took it.

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J. P. JACKSON: We have a few seedlings down in the southwestern part of the state we are propagating. There is no mention of them here. We have a seedling there that is growing there for the last twenty years. I had it on exhibition at the State Fair. We have the Hutchins Red and the Hutchins Sweet that we raise extensively there and several other seedlings I might mention. You have all seen the apples; I have had exhibitions here for years. We have one seedling there, the tree is forty-six years old and as sound as a dollar today. It is called the Warren apple, for the want of another name. I think we have done a great work bringing out seedlings; yet they are not on any state list that I know of.

C. G. PATTEN: Some years ago I queried in my mind whether the State of Iowa would ever be able to produce apples of as high a quality as some of our eastern fruits, like the Jonathan and Spitzenberg, and the like, and I am glad to learn and know, from Mr. Lathrop that that belief has been sustained, by the production of apples of the high quality that he has mentioned right in the latitude that is one of the best, in my mind, for the production of as high a quality of fruit of any apples in the United States, and that is right in the southern part of Iowa, where we have the normal heat and moisture combined, and the length of season, for the development of the finest apples. I had in mind, several years ago, the production o sweet apples. In the northern part of the state, and I believe the same is true of the southern part of the state, we have a scarcity of sweet apples for every season of the year. We have a small one that has appeared this year, a seedling of the Wealthy, that is at least equal to any that I have tested. What size it may attain, I am unable to say. But it proves the thought I had in mind, that our climate is such as will develop apples of the finest quality. I have grown some from the seeds that Silas Wilson sent me, of the White Winter Pearmain and Winesap. The Ben Davis seedling took the second premium at your State Fair. We have such a wide range of longitude and latitude that apples like the Winesap, Ben Davis and the Fameuse will have a constitution superior to any other apples we have. The Greening has been spoken of. A gentleman who has been down from Manitoba, A. P. Stevens, I think, told me it was the most vigorous and hardy bearing apple he had at that station.

MR. BURNAP: There is another one of Mr. Patten's apples on our northeast Iowa list. That is the Iowa Beauty. It is an apple

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that fills a commercial necessity. There is a little time after the Duchess has gone before the fall apples come in. His Beauty fills just that place. It is a good cooker and is a magnificent tree. I really believe, for us in northern Iowa, it is a valuable acquisition.

THE PRESIDENT: Is it of a fair quality?

ANSWER: It is a number one and a good cooker. He got a dollar more a barrel for his Beauty than he did for the Duchess.

A. F. COLEMAN: We have several seedlings in our part of the state that are a real success. I have several on my farm that are valuable. I have one that I think is taking the place of everything I have on my farm out of about one hundred varieties, unless it is the Jonathan. One of these fine days I am going to introduce it to the public.

THE PRESIDENT: We will listen to the report of A. F. Collman as a delegate to Missouri.

REPORT OF DELEGATE TO MISSOURI.

BY A. F. COLLMAN, CORNING.

Meeting opened Tuesday evening with Vice-President D. A. Robnett in the chair and L. A. Goodman, secretary. Mr. Goodman is the magnet around whom all other bodies move. The hall was elegantly decorated with flags, bunting and plants, and the tables loaded with fine fruit. The opening session was of a literary nature, rendered by the young people of Farmington. Farmington is noted for fine schools and churches, which speaks well for her citizens, and especially her young people. The meeting was very highly entertained, which numbered something over one thousand. Mr. M. Butterfield, of Farmington, gave a valuable paper on the future of southeast Missouri as a fruit and mineral section, for which said section is noted. Prof. J. C. Whitten gave object lessons in pruning the peach—he would cut back while the trees were young and head as low as possible. The grafting system was discussed by S. R. Hammond, of Olden, and the general drift was in favor of the piece root system. Paper on pruning provoked considerable discussion, and the sentiment of the people was prune as little as possible. W. R. Wilkins read a valuable paper on crops in the orchard. Would sow cow peas, rape, barley and rye, and let the hogs harvest the crop.

We looked over the fruit, which was very nice, and found about four hundred and fifty plates on the tables. Most of these varieties are grown in Iowa, with the exception of the Ingram, Pane's Late Keeper, and the Nixenite. The former attracted our attention as a valuable commercial apple. The apple is of good size, good quality, color, and an excellent keeper.

The Gall Knot or Black Knot is on the increase, and seems to trouble the minds of the leading horticulturists. Efforts are being made to eradicate the trouble. Clean culture and cold storage are leading topics of their meet-

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ing. Cow peas are highly recommended by all the leading orchardists, then they turn in hogs to harvest the crop. The Bitter Rot is also troublesome in the south half of the state, and the students of horticulture are trying to find a remedy. The question as to varieties to plant was given considerable attention. Most of the best growers would only plant five or six varieties. Jonathan, Grimes Golden, Ingram, Gano, Minkler, and Ben Davis. The election of officers was done in a most harmonious manner and the society all worked together, and are trying to place Missouri at the head of the fruit states in the Union. We found Professor Stinson and Professor Irish, both students of our Agriculture College, doing a good work in Missouri. We were kindly treated and the members sent many kind words to our society.

MR. BURNAP: We have a couple of gentlemen here from Missouri who have been engaged extensively in commercial planting, and the sum total of their report was that apple planting in that section was a failure. I want to ask, does your observation and talk with the members there corroborate their statements?

MR. COLLMAN: Down in eastern Missouri, you know they have the cold currant that follows the Mississippi River. There is not so much difference there in the latitude as you might expect. You know the severe winter of '98 reduced the vitality of our orchards. You take the western part of Missouri, up in the Ozark country where the trees were not so much effected, apple growing is a success.

A MEMBER: That Ozark region was the place they referred to.

ANSWER: You will find men once in a while, in southern Iowa, who says fruit growing is a failure, and many of them are making money at it. You will find it so in other business. I do not think we can even raise a nice family without some trouble.

PROFESSOR PAMMEL: The chief trouble down in the Ozark region is the fungus trouble. That disease has been in the Ozark region for a good many years. I investigated it down in Texas. This disease seems to be due to one of the mushrooms. The fact is these people do not use due caution in getting their orchards started. This disease seems to be entirely different from what I saw ten or eleven years ago.

MR. LATHROP: Were you here yesterday and heard the various troubles Major Holsinger represented, a combination of which almost proved fatal to the crops raised in that district. He called attention to the trouble known as the "Goose-eye."

PROFESSOR PAMMEL: I would say, so far as apple rot or bitter rot is concerned, that it is generally agreed, by spraying the disease can be prevented. This particular root rot, I investigated that quite carefully. You let it get started and the whole thing

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will go. I do not think as to the other diseases they need fear any trouble. Of course, this year has been exceedingly favorable to them.

A MEMBER: Professor, if that disease is introduced here, do you think it will thrive?

ANSWER: I think not. The Oklahoma and Ozark root rot will propagate. They have originally a great deal more forest there, and that being true, the fungus seems to propagate more favorably there than in this country.

MR. COLLMAN: This trouble they had there is not a rot. That is another disease. There is this gnat gall; it is parasitic.

A MEMBER: In the development of that gnat gall, has the condition of the soil anything to do with it?

PROFESSOR PAMMEL: I do not want to answer that question, because I have not looked into it sufficently. I think, however, it seems to prefer heavy black soil.

PROFESSOR PAMMEL: I have here a resolution which was offered at the Agricultural Society and adopted and I desire to offer the same here:

WHEREAS, A petition is now before congress from the people of the state of Minnesota, asking the setting aside of a certain tract of timber land in the vicinity of Mille Lacs lake in the northern part of said state, estimated to contain about 800,000 acres of land and water, as a national park and forest reserve, for the purpose of preserving the timber and conserving the water supply of the sources of the Mississippi river; and,

WHEREAS, There are other tracts of waste lands in the northern part of said state and of the state of Wisconsin, from which the pine timber has been removed and which, because of the worthlessness of the soil for agricultural purposes, has reverted back to the government; therefore,

Resolved, That the State Horticultural Society of Iowa, in session assembled, hereby petition congress to segregate for park and forestry purposes the said Mille Lacs tract above referred to and such other lands as congress may have control over in said states of Minnesota and Wisconsin, to the end that the timber supply of said states may be thus partially saved, a reserve created for the preservation of a remnant of our wild game animals and birds, and a great national park created for the use of future generations.

Resolved, That as the work of the government forest reserves falls under three heads, viz.: the geological survey, the land office department and the department of agriculture, and inasmuch as the work is of a technical character, the forest work should be co-ordinated under one head and carried on preferably by the department of agriculture, to the end that a rational system of forestry may be inaugurated.

Resolved, That a copy of these resolutions be forwarded to each member of congress from this state, to its two senators and to the president of the State Horticultural Society of Minnesota.

Upon motion the same was adopted.

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THE PRESIDENT: We will now hear a paper entitled, "What kind of work should the State Horticultural Society do to Promote the Interests of Horticulture in Iowa," by Professor L. H. Pammel, of Ames.

WHAT KIND OF WORK SHOULD THE STATE HORTICULTURAL SOCIETY DO TO PROMOTE THE INTERESTS OF HORTICULTURE IN IOWA.

BY PROF. L. H. PAMMEL, AMES.

I have now been in the state something over eleven years, and have watched with some interest the horticultural progress in the state. I have attended the meetings of the State Horticultural Society, as well as some of the district meetings, so far as I have been able to do so. I have been interested in many of the papers presented for they have done much to stimulate horticulturists to do better work. I have seen some things that I should like to criticise as a looker on. I have in fact been a participant in some of the affairs of the society that are objectionable. I refer to the feeling that has existed as to the supremacy of certain parties in running the society along certain lines of work. It is a lamentable fact that the young men of the state cannot be induced to take a more active part in the deliberations of the society. It is the older men who are called on to prepare papers and otherwise keep the machinery in operation, as the young men are not here. The society should make an earnest effort to induce the young men to come in.

Another lamentable fact is that such a small number of non-professional horticulturists become members of the society. The amateur should especially be invited to come in.

A perusal of the published volumes of the society seems to indicate plainly that the term horticulture has been used in its narrow sense, namely a study of fruits and fruit growing, and yet the vegetable industry if taken in the aggregate, surpasses the fruit industry. Why not make the society broader and induce men of every rank to participate in its deliberations? Would it not give greater strength to the organization?

The society elects a secretary and so far as I can learn his chief work is of a clerical nature He edits the proceedings of the society and answers such correspondence as may come to the office, and incidentally works at a few problems. The secretary has only a small fund at his disposal to carry on certain important lines of work. It seems to me a far better plan would be to centralize the horticultural work of the Horticultural Society and let the secretary see that the work is carried on properly. Put funds at his disposal and let him be responsible for the work. The United States government has seen fit to demand that all sub-stations in connection with the United States Experiment stations shall be abolished. The office of experiment station holds that the best work cannot be done when the work and money is divided. We want more coördination and cooperation.

Experiments should be planned to extend over a series of years. Experiments planned for a year and then dropped are certain to be of little value.

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A little over a year ago I visited the celebrated experimental grounds of Luther Burbank of Santa Rosa, California. I was not only surprised at some of the results he has obtained but at the amount of money it cost him to carry on his experiments. Mr. Burbank spent $30,000 in breeding fruits and plants. Would it have been possible for him to produce what he has done in the way of promising and valuable fruits if his energies had been spent along six or seven different lines? Surely not. Mr. Burbank has set an example not only for private growers but for the experimenters as well. Suppose this society should say at this time: We will use all of our energies in breeding and selecting certain kinds of fruit. How much more important would be the work accomplished? Members of our own society have by private means accomplished much for the betterment of the horticulture of the Northwest. In one of our neighboring states, South Dakota, broad lines of experimentation in breeding fruits are being carried on. Professor Hansen informs me that they have a fine lot of new seedling strawberries, currants, and gooseberries, and that they are making this their chief work. I doubt whether the experiments anywhere else in the Mississippi Valley are so extensive. I mention this to show that it takes all of one's attention to carry on this single line of work.

Greenhouses and experimental fields are required. Why not co-operate with the State Agricultural Society in maintaining a greenhouse and some experimental grounds on the state fair grounds? Right here let me suggest that there ought to be greater co-operation with the Agricultural Society. The grounds should be looked after by the Horticultural Society. They should be planted with proper trees, shrubs and herbaceous plants. The Horticultural Society should work in unison with the agricultural department in securing an agricultural building for the display of agricultural and horticultural products and implements, in fact, anything that belongs to a museum along horticultural lines should be planned by this society. In this great agricultural state a permanent museum of this character should be a great feature. The time is coming when we will have a great agricultural bureau with the different departments co-ordinated, just as the national department of agriculture. There may be some opposition to this arrangement, but it is coming. I expect to see the day when the commissioner of agriculture or secretary of agriculture of the state will be on the same basis as the secretary of state, a member of the executive council and elected by the people. All the bureaus amenable to the civil service rules. Certainly in horticultural and other agricultural lines of work the best work cannot be obtained by frequent changes.

Every member of this society should do his share in trying to elevate the profession of horticulture and agriculture, to bring it up to the same dignity as the legal or medical profession.

So much then for a few criticisms. The society certainly has done some good work in the breeding of fruits. I need only mention some of the work carried on by the society and private individuals. The work of Fluke, Patten, Terry, Watrous, Budd and others is bearing fruit.

There are some lines of work in addition to the important work of breeding fruits that this society should carry on. I refer to the work done by an old member of this society, Captain R. P. Speer, in studing the adaptations of scion to stock. The work carried on so successfully by Captain Speer

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should be recorded with full notes for future reference. The society should do something towards getting a good valuable working library, so essential to every working horticulturist. Of course many publications can be received gratuitously such as the experiment station publications, and the publications by the national government. There are many publications that cannot be obtained gratis as are the more technical paper. Some of the foreign horticultural publications. These should be purchased. Certain standard works in forestry, horticulture, botany and entomology should be added to the library. I believe the librarian should have at least one hundred dollars to spend for this purpose. In a paper presented at the meeting of the Southeastern Horticultural Society I made the suggestion that accurate descriptions of new seedling fruits should be made, these to be accompanied by drawings if possible with colored sketches or a model of the same. I believe further that this society should not sanction the naming of a fruit until it is clearly shown that it is new. Before much can be done however it will be necessary to prepare monographs of the different fruits. It seems to me that this society could do a very laudable thing in offering prizes for the best monagraph on apples, or the best monograph on grapes, or for the best monograph on the breeding of fruits.

Nor should I fail to mention the important legislation on the San Jose scale and other destructive diseases. The law should be strengthened and the state entomeologist assisted until the needed legislation can be obtained.

The State Horticultural Society should do something more towards making a collection of plants, especially economic. In conclusion, we ought to make the Iowa State Horticultural Society one of the best in the union, but to do this we must all work together. All dissensions should cease, and we should work unitedly for the best interest and welfare for Iowa Horticulture.

Upon motion the President appointed a committe of five members to meet with the Directors of the Agricultural Society and take up the matter of improvement of the Horticultural Hall at the Fair Ground.

The committee named was as follows: Mr. Bomberger, Mr. Patten, Captian Watrous, Secretary Greene and Professor Pammel.

THE PRESIDENT: The next on the program is a "Report on Spraying" by Professor E. E. Little, of Ames.

REPORT ON SPRAYING.

This report is a summary of the work outlined by Professor Craig, which was carried on at the following places: Osage, by President C. F. Gardner; at Glenwood, by Mr. J. P. Jackson; at Knoxville, by Mr. B. A. Mathews, and at Des Moines, by Captain C. L. Watrous. In the distribution of the material for spraying the committee decided in the light of last years experience to have it shipped directly to the various places, instead of distributing it from the central station thus reducing the expense of reshipping. This plan was carried out.

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Below are the reports from the different places named above, except the one of J. P. Jackson at Glenwood which will be read by himself.

OSAGE, IOWA, Nov. 19, 1900.

Professor E. E. Little:

DEAR SIR—With regard to spraying on our grounds during the season of 1900, I respectfully make the following report:

The trees and plants sprayed were apple, plum, grapes, gooseberries and currants. In spraying we followed the instructions given in the spraying calendar for 1900 as sent out by Professor J. Craig.

The plum aphis which has been so plenty here during the past few years and done great damage, we appear to have got fully under control and this season a person would have to hunt to find any. Diluted kerosene is what has cleaned them out on our grounds. We find that two applications with the sprayer set at 10 per cent kerosene will corner them. Plum rot was quite bad in this section, but on our sprayed trees there was very little of it. On our plum orchard, that was sprayed three times, we had the finest crop of plums that ever has been raised in this section.

There is no doubt but that all apple trees subjected to treatment were highly benefitted, not only better fruit, but better foliage. Insects on them were scarce on account of their being sprayed so well last season.

Grapes were sprayed twice, before the buds started, and after the blossoms had fallen. In the fall the fruit and vines were perfect. There is no doubt in my mind but that spraying pays.

Yours truly,

CHARLES F. GARDNER.

KNOXVILLE, IOWA, Nov. 19, 1900.

My spraying operations this summer were confined mostly to plums of the domestic class, about twenty varieties in all.

The season was against me to some extent on account of the excessive rainfall, nevertheless I got through with splendid crops of some sorts; fair crops of other and lighter harvests of still other varieties. Very little rot occurred among the Spauldings and Damsons. Moore's Artic behaved well also. The hardest customers to deal with were Tatge, Victoria, and Duanes Purple. Still a very good crop of the first mentioned kind was secured. It would be useless in this locality, to attempt the raising of these sorts without the timely and persistent use of Bordeaux mixture. In using this mixture, I put in nearly double amount of lime called for in the ordinary formulas, and have never seen a leaf of either plum or pear injured in the least. When Professor Craig was here he called my attention to the perfect foliage of the trees. This was when the Green Gages were ripe. The trees had received six complete sprayings. Perhaps this number of showerings is better than any other number less than seven. This is the second year I have had very good success by using the Bordeaux and consequently feel encouraged to try it again.

Very truly yours,

B. A. MATHEWS.

DES MOINES, Nov. 19, 1900.

In response to yours of the 17th, the summer was so very wet and my work crowded me so much that I did not spray until the last part of the season when I sprayed a block of growing grape vines which were attacked by

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the powdery mildew. The spraying was with Bordeaux and had a most excellent effect so that I think it was the cause of saving to me the crop of vines. Very truly your,

C. L. WATROUS.

At the college this season we defended squash plants and prevented their destruction by the striped squash bug, spraying with the Bordeaux mixture and Paris Green. The spraying of these plants was carried on every few days. A close watch was kept on the plants and whenever any signs of the plant being destroyed by the bug another spraying was done.

The plum aphis was found upon the twigs of plum trees in the college orchards this year, and by two applications of kerosene emulsion these pests were destroyed.

I think possibly in addition a few cardinal suggestions on spraying found in Prof. L. H. Bailey's "Principles of Fruit Growing," which doubtless many members of the society have read, but may be of interest to those members to hear them again, and especially helpful to those who have not read them.

1. Spraying is only one of the several means or operations which the fruit grower must master if he aspires to the greatest and most uniform success.

2. Spraying is not necessary to successful results every year, but inasmuch as the farmer cannot foretell the need of the operation, he should spray as a matter of insurance.

3. Spraying is almost sure to be of some benefit every year, particularly upon apple, pear, plum, and quince trees, and upon grape vines.

4. Spraying is of little consequence unless carefully and honestly done, the spray must actually reach every point which it is intended to protect.

5. Prepare for the year's campaign during the previous winter by reading the last teachings and completing the pumps and appliances.

6. The Bordeaux mixture need not be made up at each using in the exact numbers of formulæ. Copper sulphate may be permanently dissolved in water, and the lime may be slacked when the mixture is prepared; the stock solution of blue vitrol is diluted, lime added and the tank filled to the required amount.

7. Pure Paris Green dissolves in ammonia, giving a rich, deep blue liquid.

It is left to the members of the society to decide if the results justify a continuation of this work to bring it before the people.

For my part, the results prove that great good comes from spraying each year, and should be carried on another season to popularize it.

MAJOR HOLSINGER: Professor, have you had any experience with the dry or dust spraying?

PROFESSOR LITTLE: No, I have not.

MAJOR HOLSINGER: We had a person at our meeting who talked of the superiority of it; he talked very well; he could accomplish wonders, while he himself was covered with the dust, including Paris Green. There were quite a number of votaries there that spoke favorably of it. For myself, Mr. Chairman, I

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have been "ferninst" the whole spraying business. I am awaiting developments. Ten years ago there were men who could tell me all about spraying that today say it has not been satisfactory. I want to know, however, if that dust sprayer is certainly advantageous over the liquid spraying, if spraying is a success at all. I admit that all foliage eating insects can be killed by Paris Green if you can get it into their systems. But just how you can get it into the Codlin moth and others, is something very different. I have seen a great many experiements along that line. Such men as Judge Wellhouse, known as the Apple King, is determined there is nothing in it. The trouble was it was a panacea for everything and the insects have gone on until they have threatened almost the very foundation of fruit growing.

PROFESSOR LITTLE: I think fungus disease should always be treated under two heads. For instance, there is no use treating the potato scab, unless you try to clean the soil.

A MEMBER: Will you please say a word about spraying the apple scab.

PROFESSOR LITTLE: From the results of others and from the apples that I have seen, where the treatment has been made, it is very effective. For instance, a few years ago they had at the Missouri exhibits a collection which had been sprayed and another collection not sprayed. There was a wonderful difference between the sprayed and non-sprayed apples. I think spraying has come to stay. The apple scab is not a difficult fungus to treat. Take what is called cherry rust or spot diseases of the strawberry, or any of the mildews, for instance, take the plum rot and the black rot, they are more difficult. There is no doubt at all that you can prevent scab with the Bordeaux mixture. You must bear in mind that you will have to use a little common sense in spraying.

MR. PATTEN: I want to speak a little further about this spraying. While at the Minnesota meeting, Mr. Lord made a statement there, that he had carefully picked out the dry plums, or fungused plums; he had cleaned his orchard; he had been very careful to do that and picked them from the trees. He stated that the next year he had more plum rot than ever. He said that Mr. Kerr of Maryland had the same experience one year. So far as the apple is concerned, I have had some experience with that. Several years ago we were troubled with the black rot, and as the years went along rot and fungus of one kind or other began to accumulate and our apples were almost worthless. This year my son began spraying quite early and thoroughly; I was not at

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home. We sprayed that orchard three times over, with the result that buyers from Minneapolis to whom we had sold some 260 bushels, said they were the cleanest and finest apples they had bought this year. I used every means, however, to put a lot of shoats into that pasture; they cleaned up the ground, and have cleaned up the rubbish so that there is not a sprout there. This last summer Professor Craig wrote me of an orchard in western New York, an old orchard that had become entirely unproductive; it did not pay for the care of the apples and had not for several years. They thoroughly cultivated and pruned it and sprayed it thoroughly, with the result that in one year they sold from that orchard between thirteen and fifteen thousand dollars worth of apples. I thought it was a pretty good result from an orchard that was in that condition.

P. F. KINNE: I would like to ask what these three sprayings consisted of?

ANSWER: We used Paris Green for all of the sprayings; but little of it comparatively in the first spraying. We sprayed before the buds of the trees started to open. We used four ounces of Paris Green to fifty gallons of water; that is the proportion in which we used it. We did not get rid of the Codling-moth as I had hoped to by spring, or having the shoats in the orchard; but it was, I believe, the whole ground had become so thoroughly affected that it was impossible to rid the orchard in one year.

WEDNESDAY EVENING SESSION, 7:45 P. M.

THE PRESIDENT: We have with us Professor Wm. Robertson of the Minnesota Agricultural School and I now take pleasure in introducing him to this society.

PROFESSOR ROBERTSON: I had some very nice things to say to you this morning; but I presented my credentials to the President, and then I got square in front of him, where he would have to look at me, and see if he would not give me a chance to make a speech to you. But he would not do it. I finally concluded that he classed me in the list with the plums Mr. Reeves spoke of this morning. He saw that the top growth was not very good, consequently, since you were trying to exclude everything not Americana, I thought you concluded to keep me out.

The first thing I heard in the way of remarks on the street car, was something about the Minnesota Horticultural Society, about

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the enthusiasm of the members, I concluded it could not be that that society had anything against this society. It is a fact that the Horticultural Society of Minnesota is a very enthusiastic body of men and women, and they sent with me their most hearty greetings and God-speed to this society, in the work that you are doing. Incidentally I bring to you greetings from the Minnesota Agricultural School and College, which is engaged in studying the very principles in which you are at work today, and in which I find you are very well along. How to develop the enthusiasm spoken of, is illustrated by the statement made by Mr. Bomberger, who explained how he got into the Agricultural Society. It was because somebody drove up and wanted him to do something. He did so and since that time was enthusiastic. So instead of appointing committees for this or that purpose, you get a party to do something and as soon as you get him to do something, you may be sure he will be enthusiastic. We give one evening in nearly all our State Horticultural meetings to the young people. They have a program and the whole program is probably filled up by these people, and from that time on they are a part of the Horticultural Society. They take an interest in the work, and you have so many—I was going to say before I got mad—you have so many good things here that are going to waste on these old members, who are posted way up, that might be disseminated throught the study of these younger people. Now, I feel that I have expressed all the meanness there is in me and feel a good deal better than I did this morning, and seeing you had nothing against our Horticultural Society, I feel at ease in the association hereafter, and I want you to understand hereafter, I expect to talk whenever I please.

A MEMBER: I move you, Mr. President, that the first officers we are going to elect, shall be an honorary member of our society and that member shall be Professor Robertson of Minnesota. Motion prevailed.

THE PRESIDENT: We will now proceed to the election of officers and nominations are now in order for President.

DR. POWELL: presented the name of M. J. Wragg as President for the ensuing year. Upon motion the rules were suspended and Mr. Wragg was elected President by acclamation.

Upon motion the rules were suspended and the Secretary directed to cast the ballot of the association for N. K. Fluke for Vice-president.

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Upon motion the rules were suspended and the Treasurer was instructed to cast the ballot of the association for Wesley Greene to succeed himself as Secretary of the Society

Upon motion the rules wese suspended and the Secretary instructed to cast the ballot of the Society for Elmer Reeves, of Waverly, for Treasurer.

DIRECTORS ELECTED.

For director of the first district, C. G. Blodgett, of Mt. Pleasant.

For director of the third district, Silas Wilson, of Atlantic.

For director of the fifth district, W. O. Willard, of Grinnell.

For director of the seventh district, Ben Schontz, of Correctionville.

For director of the nineth district, B. F. Ferris, of Hampton.

For director of the eleventh district, W. A. Burnap, of Clear Lake.

For director of the fourth district to succeed N. K. Fluke of Davenport, William Langham of Cedar Rapids.

THE PRESIDENT: The next paper on the program is entitled, "Why Plant a Tree," by W. A. Burnap, of Clear Lake.

WHY PLANT A TREE?

BY W. A. BURNAP, CLEAR LAKE.

I once had a warm personal friend who was an apple packer by profession, and an enthusiastic orchard planter, both in theory and practice. This friend in hustling for fruit to pack, traveled south, east and west, all over the apple producing regions of the United States; and he frequently told me that there was not the slightest danger of over production of the apple. He said, while the demand for apples was yearly increasing, his observation had shown, that, excepting southern Iowa and some parts of Missouri and Kansas, there were ten orchards dying from starvation and neglect where one new one was being set and cared for. This seems a strong assertion, but he persistently refused to either qualify or amend it. This outlook is not flattering, but now, to make a bad matter worse, our own secretary, Wesley Greene, came before our last annual meeting with his *deadly statistics* and showed that, even in the three south tiers of counties of Iowa, even in the favored and excepted locality of my friend, even in the "banana belt" of Iowa, there were 1,256,277 less bearing apple trees in 1895 than in 1885, a loss of 45⅓ per cent. The showing of trees not in bearing was little better, excluding the planting of Mills county, there was a falling off, during the same decade of 669,386 young trees, or 42⅛ per cent. If we include Mills county, the loss was 525,726, or a little over 32 per cent.

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This is not the only thing that might shake the faith of a *weak-kneed* Iowa horticultural optimist.

As I drive about my own county and ride over the state at large, I notice that the windbreaks, roadside trees and hedges that the fathers in my generation planted and tended with so much care, the young men of this generation are ruthlessly cutting down. If you ask them the reason, they reply "They keep the roads muddy in summer and snow drifted in winter and above all, corn won't grow well near them." I also see that the natural and artificial groves standing upon land that can be cultivated are being grubbed out and the land plowed. If you ask why, the answer is "Land is too valuable to grow timber upon," and if you still plead that they merely thin out the trees and leave a park like pasture, and demonstrate to them that more blue grass will grow where partly shaded, they will produce some volume of my friend, Van Houten's agricultural department reports and there read the law to you that grass should, when possible, be grown where it can be rotated with corn and small grain.

All this may be good agriculture, but it is deadly horticulture, and as a horticulturist I raise my indignant protest and urge a halt in these proceedings. I stand for a less surrender to the climatic influence of a single hard winter, and for more stubborn fighting for better results, I want to see less neglect and more care, and I demand, in the interest of future Iowa, less tree cutting and more tree planting.

Why plant a tree? Because the birds
That charm the list'ning air,
May rest among its rippling leaves
And sing your praises there.

Why plant a tree? Because the beasts,
As seasons come and go,
May shelter underneath its boughs,
And their mute thanks bestow.

Why plant a tree? Because you may,
As aging years invade,
Eat of its fruit, its form admire,
Or rest beneath its shade.

Why plant a tree? Because your sons
And their son's sons the same,
For this alone, as years advance,
May rise and bless your name.

Why plant a tree? 'Cause God himself
A garden set of old,
And if you follow in His way
You'll find, mayhaps, His fold.

So then, if God, and child and you,
And beast and bird agree,
Why man! get up and hunt that spade
And go and plant a tree.

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THE PRESIDENT: The next paper is entitled, "Some Trees Adapted to Northern Iowa Not Generally Planted," by Eugene Secor, of Forest City.

SOME TREES ADAPTED TO NORTHERN IOWA NOT GENERALLY PLANTED.

EUGENE SECOR, FOREST CITY.

In this discussion it is not my purpose to speak of trees valued for their fruit, but as those classed as ornamental or forest trees.

There are a great many beautiful and useful trees adapted to every part of our state. I presume it is not exageration to say that fifty desirable varieties can be successfully grown anywhere in this commonwealth.

Then why is it that people neglect to adorn their homes with something besides the ubiquitous cottonwood, boxelder and willow.

Year after year admonition and advice is volunteered from men who have grown gray in the service of horticulture—from men whose love of the beautiful is far above sordid considerations, but how few have believed your report and acted on your suggestions. But the lover of trees is never tired of extolling their beauty and usefulness.

I am so interested in seeing peerless Iowa the state of attractive homes as well as the garden spot of the world for corn and paradise for hogs, that I long for the time to come when the spirit of home adornment shall so take hold of our people that no land owner, his children or his grand children shall ever desire to leave the old homestead with its feeling of shelter, its promise of plenty, its trees which loving hands have planted and protected, and its thousand associations which money can not buy and that make life worth the living. Every tree that is adapted to our climate, if planted, is one more link in the golden chain which binds the hearts of our children to the land we love. Nothing would do more to instill the love of home in the farmers' children than beautiful trees. The place of ones birth if surrounded by these emblems of comfort and culture can never be forgotten or lightly spoken of.

Whether trees speak to us in the soothing murmur of gently rustling leaves as we lie on our backs under their sheltering canopy, or with a sound like the roaring sea when the tempest rages about our dwelling, they voice a promise of loyalty to man's service. They inculcate tender feelings and lofty sentiments. They are preachers of the gospel of hope.

It is not my purpose to name all the trees which ought to be on every farm, but just a few which are, I think, but rarely planted in the north.

Cockspur Thorn.—As near as I am able to identify one variety of thorn common in our woods, the foregoing is the name of a small tree which, as an ornament, is hard to excell. It is a round—sometimes almost flat—topped tree growing fifteen to twenty feet high and fully as broad. Its unique shape, its perfect adaptability to our climatic conditions, its beautiful white blossoms in spring and red apples (one-half to three-quarters of an inch in diameter) hanging on till October, make it a desirable ornamental tree to propagate. I have in mind one of these on a prairie farm, planted perhaps

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twenty-five years ago, that is a thing of beauty, and if it had been imported everybody would be admiring it.

Black Wild Cherry (Prunus Serotina).—Everybody in Iowa knows this tree but it is not prized as it merits.

One might be led to think that its chief use is to harbor and feed the tent caterpillar from the number of tents seen upon some trees in a wild state, but in cultivation they do not seem to be infested with worms more than other trees. I have two fine specimens in my lawn that are no more subject to them than is the apple orchard.

One of these trees has a pendulous habit that is quite interesting, and both bear fruit of good quality, ripening in succession. I consider it a valuable tree to plant, and is easily raised. If pits from the trees bearing the finest fruit were saved and planted great improvement might be expected. There is no doubt about the value of the wood for cabinet work, and though the planter might not live to realize on the investment in a commercial way his children might. In the meantime it would feed God's birds and furnish wild cherry bark for spring fever. But I wouldn't advise him to peel the trees for that purpose.

Hackberry.—We send to China and Japan for novelties when we have them at our doors interesting and acclimated. I doubt if one farmer in one hundred could name the tree if you should show him a hackberry; yet it is a native, as hardy as a bur-oak, and makes a fine ornamental tree of medium size. It ought to be preserved and its use extended.

I have never tried it, but I believe this can be propagated from root cuttings. My reason for thinking so is the fact that I have seen young sprouts coming up near larger trees where the bank had been cut by roadmakers. I should think nurserymen might propagate it from seed.

Coffee Tree.—This is a native of Iowa, I believe. At any rate, it is perfectly at home in the extreme northern part. It isn't a tree which I would recommend for shelter belts or timber, as it is rather a slow grower and not particularly valuable for wood; but where one has the room and wants a variety, it is interesting.

The tree resembles in leaf the walnut. Its terminal branches are blunt. Its seed pods resemble a lima bean.

Seldom seen north. Easily raised from seeds, and I think also from root cuttings.

Honey-Locust.—This is a native of Iowa and hardy in the north. I regard it as one of our most beautiful trees for ornamental planting. If given room to develop it forms a pretty top, and its delicate foliage is not excelled by any tree I know of. In contrast with the sugar maple and linden with their dense shade, this tree lets the sunlight through in dainty twinkles that are charming to one who likes to see the ever changing expression of individual trees.

Some twenty years ago, while on a visit to Staten Island, in New York harbor, I gathered some beans of the honey-locust and on my return home planted them. Contrary to my expectations the trees have been perfectly at home, and no tree in my yard is more highly prized. Some are almost free from thorns, while others from the same lot of seed are a menace to a squirrel.

On a visit to New Rochelle, New York, this year, I found two honey locust trees, still sound, that were said to have been planted by the Huguenot refugees more than two hundred years ago.

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Buckeye.—Having been raised in a country where the horse-chestnut flourishes, and having tried more than once to add that tree to my collection and failed, I have come to think very kindly of the American variety, the buckeye. This we can grow successfully. It is seldom seen, but deserves a place among our hardy ornamental trees. The bloom is not quite as handsome as some varieties of the horse-chesnut, but is conspicuous enough to be a desirable addition to our lawn trees. It is a round top tree of medium size and height. I believe there are two varieties, differing somewhat in leaf and size of tree, and possibly in hardiness. I think it is the Ohio buckeye with which I am most familiar.

Pea Tree (Caragana arborescens.)—A small tree or large shrub from Asia, which has the merit of being both pretty and hardy. Its blossoms, which come in May, and pods later, resemble the pea, hence its name. Its foliage is its chief beauty.

This may be common in some sections but I do not often see it. I call attention to it because of its adaptability to our climate and because of its rarity. It would undoubtedly make a good hedge plant.

It must be easily propagated from seed and ought to be in every nurseryman's catalogue of desirable small trees for the north.

Walnut and Butternut.—One of the charms of New England and other Eastern states is the wealth of their autumn nut-harvest. On many a hillside pasture are scattered nut-bearing trees that furnish annually a bountiful supply of rich and toothsome fruits. The long winter evenings are made cheerful by merry nut-crackings, and the youngsters turn many an honest penny by marketing the surplus.

Walnuts, butternuts, hickorynuts, and chestnuts are found on nearly every farm. Of course the trees were there when the land was cleared, and isolated specimens were left for family use. While our prairies were not covered with these useful trees, they all thrive except the chestnut, and are not so hard to make grow as many imagine. They are easily grown from seed. They ought to be on every farm in Iowa. And it is no longer to depend on the uncertain quality of seedlings with thick shells and small kernels. Nut trees can be grafted. We ought to raise the Jonathan and Grimes' Golden type of walnuts and butternuts.

Linden.—In plantings for shade or ornament how seldom does one see the linden, and yet it is unsurpassed for beauty of foliage, cleanliness, or shade.

It is quite a rapid grower, makes a nicely shaped tree, is reasonably long-lived and is distinctively adapted to the cold North anywhere in the rain belt. Like a good many other trees it loves a rich, moist soil. While in bloom its fragrance is delightful, and the thought that its aroma may appear later in the form of honey unsurpassed in color and quality by no means detracts from its useful features.

Its use ought to be encouraged because the native basswood forests are fast disappearing in answer to the demand for a very white and light and tough wood for boxes.

The Oaks.—Among the bewitching embellishments of an autumn landscape I give the oaks first place for brilliant coloring in Northern Iowa. An October day in the oak openings when the scarlet leaves are aflame with all the stored-up warmth of a western summer, is an outing to be coveted. The

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gorgeous dress which these trees put on in defiance to expectant winter is a sermon on courage and hope which a man may well ponder as he nears the limit of his earthly career. From reddish brown to cardinal and from yellow to orange is the kaleidoscope of colors presented in such endless variety as no artist's brush can portray. It seems like an attempt of Nature to usher its children out of this world in their handsomest dress and in a blaze of glory. In some of the eastern parks I have noticed that this family is not forgotten. Imported varieties are seen, but I doubt if they excel our own in wealth of autumnal hues.

In prairie plantings what prettier effect could be produced than to mix some of the highly colored oaks among the dainty yellow of the soft maples and birches. Acorns gathered in the fall and slightly covered with litter will grow almost as surely as corn.

When going through the forest in the fall, observing how much finer the coloring is on some trees than on others of the same kind, I have wondered if these beautiful tints could be preserved or reproduced, whether seeds gathered from such would not produce better colored trees than those gathered in a haphazard way.

Laurel-leaf Willow is a tree which I have come to think well of. The deep green of its glossy foliage and its broad leaf—broad for a willow—make it conspicuous among the Salix family. An isolated specimen contrasted with another willow of golden color would produce a pleasing effect and attract attention from every passer by.

Wild Olive, (*Eleagnus Augustifolia.*) This is a foreigner, but worthy of cultivation. It seems to be sufficiently hardy to stand our long cold winters. It makes a tree twenty feet high in favorable location, and as an ornamental deserves a place in every collection.

The foliage is silvery and beautiful throughout the summer. The tiny yellow blossom, although inconspicuous, is deliciously fragrant. Easily grown from seed, I think. Sold by some nurserymen, and ought to be more common than it is.

I have only mentioned a few. There are others—enough to satisfy any reasonable taste. Plant some or all of them and be happy.

MR. BURNAP: I strictly agree with that paper, unless it is in regard to the Honey Locust. In the 50's and 60's there was a variety of locust planted that we used pretty generally over our county. We called it the Honey Locust. They never thrived good; they got probably six inches through in size and died.

A MEMBER: I think, Colonel, that is Black Locust you refer to; that is another variety.

MR. BURNAP: Well, I am glad to be corrected.

PROF. PAMMEL: I think there is some confusion in the names used in some sections of the country; they do refer to that as a Honey Locust. On the other hand, they refer to the Honey Locust that Mr. Secor refers to, as the Black Locust. In the East, generally, we refer to the other plant as the Honey Locust. If you will permit me to make a few remarks,—I am very much

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interested in the paper. There are two trees I want to call your attention to. Two or three years ago I was very much surprised, in going up the Iowa river, that we had the native Cherry Birch in Iowa. There are some remarkably fine specimens at Steamboat Rock, and that is the only place they grow in Iowa. We have also the White Pine and White Birch; these are the two trees tnat I think do admirably. They make a remarkable growth.

A MEMBER: What is the life of the White Pine?

ANSWER: From two to three hundred years. There must have been trees at Steamboat Rock about three feet in diameter.

QUESTION: Were they planted there?

ANSWER: No, sir, they are native trees.

QUESTION: When removed from their natural habitat how are they?

ANSWER: I do not know; I should think they would grow as well as native. I do not see the White Pine anywhere in the state but what is thrifty and vigorous.

MR. LATHROP: They are all dying out at Iowa City.

ANSWER: I think that the coal smoke is injurious to them.

MR. LATHROP: No, this is true where they are beyond the reach of the coal smoke. They are dying out in our cemetery, just beyond the reach of the smoke. There have been three trees cut down from the adjoining lot I occupy in the city. It is the same in our cemetery.

QUESTION: How far is that removed from the railway?

ANSWER: About three-quarters of a mile.

PROF. PAMMEL: These people down there discussed that question at the Southeastern meeting. It is evident from the discussions that it was a lack of water during the dry years that killed, as it did the hard maple, some of them.

MR. FLUKE: We have thousands of them in eastern Iowa; I never knew of any dying.

M. J. WRAGG: In listening to the paper of Mr. Secor, I expected him to say something about a big tree up there; it is this large, beautiful poplar that grows in groves in Minnesota. It is found upon the Iowa river here, and if there is any tree more beautiful and symmetrical in form, it is that poplar. There is another tree that ought to be more known in the north on account of its great beauty of foliage; that is the *Acer Ginnala*, a specie of maple. I do not know where it is from. It does put on the most beautiful and gorgeous array of colors every fall one

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may desire to see. It grows about fifteen or eighteen feet high; bushy and perfectly hardy. It certainly should be better known. I was glad to hear such encouraging words about the Hackberry. That is one of the trees that is neglected here by the nurseries; they do not see its beauty until they once see an isolated tree.

A MEMBER: I would like to ask Prof. Pammel about this poplar—what did you call the name of that tree?

PROF. PAMMEL: It is something like the Trembling Aspen, except the leaves are cut a little deeper; they are more strongly cut on the margin.

A MEMBER: Isn't it a specie of Cottonwood?

ANSWER: No, it is a specie of the Aspen, like the Trembling Aspen; I do not think it ever gets to be more than two or two and one-half feet in diameter and about fifty feet high.

A MEMBER: The Pin Oak is becoming quite popular in the east. Do you find the Pin Oak a native of Iowa?

ANSWER: Yes; it is found in Keokuk county and southeastern part of the state.

QUESTION: Is it a fast grower in the west?

ANSWER: It is very much like the Red Oak.

QUESTION: Would there be any probability of it growing on our eastern soil?

ANSWER: Along south of the Chicago Northwestern Railway it grows on wet ground; though I have seen them grow on clay soil in Missouri.

QUESTION: Is it a form of the Black Oak?

ANSWER: It is a form of the Red Oak. The Pin Oak get to be a good sized tree; the largest I saw was down in Lee county, about two feet.

PROF. ROBERTSON: I wish to ask if anyone here ever planted an ordinary Sumach in his lawn. Talk about beauty; if we had to pay a dollar or a dollar and a half apiece, if they came from some other part of the country, we would pay it quick. I never have yet in my running around, seen any one put any of those on the lawn. I don't think there is anything more beautiful.

A MEMBER: I do not want to throw cold water on the professor's opinion of the Sumach, but I would sooner pay a dollar a piece to get them out.

JOHN M. CHAFFEE: I would rather have an evergreen on my place than any other tree I know of, unless it is a fruit tree. They make shade in the summer season and a wind-break in the winter season, when you need it. When I get out from behind

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my groves in the winter, I think I am very near the North Pole; so much so that I frequently hunt my hole, as the saying is. So far as the wild cherry is concerned, I would give any man fifty cents a piece that will eliminate them from my farm.

A MEMBER: Why eliminate the wild cherry?

ANSWER: I do not expect to live long enough, so that it will make lumber; the birds scatter the seeds all over the place; they are everywhere; they are on the roadside; you can't work the road in places, for the wild cherry you will find there, and the birds scatter them all over the field. If you want to get rid of an evergreen, all you have to do is to cut it down.

THE PRESIDENT: The next paper is entitled "Horticulture; Its Relation to the Home," by S. J. Councilman, of Carlisle.

HORTICULTURE—ITS RELATION TO THE HOME.

BY S. J. COUNCILMAN, CARLISLE.

I think I run no risk of contradiction by saying that the relation of horticulture to the home is both intimate and vital, touching it upon its financial or material, its moral and intellectual, its sanitary and sentimental sides with a power for good, that if fully utilized would enable the people of our fair state to realize far higher ideals of the home than they have hitherto reached.

I have no hesitancy in saying that intelligent horticultural work gives good financial returns, remember I say intelligent, for a man must know what to plant, how to plant, where to plant and how to grow and care for what he plants to realize a profit from the planting, even then, a test winter may scoop him out of his anticipated gains.

If the man who keeps a medium sized family well supplied with fresh fruits in their seasons by purchase, would keep an expense account of the same, and compare with his neighbor who wisely plants and carefully grows for home consumption, he would be in a position to judge as to financial results, but in a majority of cases the non planter goes without, or has fruit semi-occasionally and imagines he has made a gain upon his neighbor, when he is realy the looser, having lost much of the enjoyment of life, if not some of the esteem of his family, of which there is danger to the negligent father.

The cost of land is small for a home supply of fruit on an Iowa farm, the cost of nursery stock bought direct from the nurseryman need not be great, and the caring for the same would be a relief and diversion from the drudgery of the farm, to most farmers, as it has been to me. I therefore hold to my original position—that intelligent horticultural work pays.

Horticulture has a moral and intellectual influence upon the home that is far reaching in its effects. Discontent is one of the most fruitful sources of immorality and crime and nothing on the farm breeds discontent faster than the absence of those comforts and adornments which horticulture alone can supply; no restful lawn, no sheltering shade, no delicious berries, no orchard

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fruits, without these the farm would be like a song with the melody left out. What wonder that the boys and girls tire of it, fly to the city and are often lost to a useful life and enter upon a career of crime that bring gray hairs in sorrow to the grave. My farmer friends! make your homes so bright and beautiful that your children will leave with tears of regret and not with feelings of relief.

There is also an intellectual stimulus in horticultural work that is wanting in the routine work of the farm that has awakened in many a boy a desire and ambition to be something, and to do something, that will make the world better because he has lived in it.

As to the sanitary effect of horticulture little need be said for the rich distribution of its products and their general use throughout the civilized world prove them to be a necessity to the comfort, health and proper physical and mental development of the human race. Fruit is natures' tonic for the human system which she is ready to supply in rich abundance to meet its needs througout the varying seasons of the year.

Touching the sentimental phase of this subject I will say that the man who willfully neglects to provide his family with fresh fruit in their season and makes no effort to bless and beautify his home by the aid of horticulture has not that affectionate regard for the comfort and wellbeing of his dependents, which he ought to possess, nor will the fact that it costs to do this excuse or paliate the neglect. It costs to use tobacso, to have fine horses and carriages, to waste machinery by letting it lay in the fence corner without protection or repair, none of these things belong to the necessary expense of the farm, and, frequently enough could be saved therefrom to provide an ample supply of fruit for the loved ones who will all too soon go from our homes bearing memories of selfish neglect, or of thoughtful provision made for their comfort and happiness, even through sacrifice and toil. Brother farmer, would you give highest proof of unselfish love for your family, plant trees for shade and beauty, plant trees and vines for fruit; plant shrubs and bulbs for leaf and flower, aye; keep on planting and care well for what you plant, for eternal vigilence is as sure to bring you the blessings of the one as the other.

Horticulture the name
Of a calling, not tame
But filled with the keenest delight
Unto him, who will take
What it offers, and make
A home that will gladden the sight.

'Tis its mission to grow
What no art can bestow,
Those blessings in which we may trace
The mercy and love
Of our Father above,
And His provident care for the race.

Come with me, I pray,
Let us take a survey
Of what it can do on the farm,

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To add comfort, and peace,
Thus our life's joys increase
By gifts that bring blessings, or charm.

First we visit the lawn.
And mark well, thereon
The shade tree, the shrub and the flower,
He were surely a clod
Who could walk over this sod,
Yielding nothing to nature's sweet power.

Walking on, we pass by
Where the strawberries lie
Peeping out at the ripening sun,
And we see the sweet maids,
In their ginghams and braids
Picking fruit that is equalled by none.

Then to orchard we hie
And vainly we try
To absorb all we find to delight,
The trees in full bloom,
The tragrant perfume,
The hum of the bees in their flight.

Come with me again,
When autumn holds reign,
And the trees are well ladened with fruit,
They will, blushing, greet
And invite you to eat
Of those, which your pleasure may suit.

When the harvest is o'er,
How welcome that store
Which we find in the pantry and bin,
In the long winter night
How inviting the sight
Of the basket of apples brought in.

When the cold winter blast
Has its chill o'er us cast
And the shelter we seek and enjoy,
There is nothing so fine
As a thick belt of pine
Old Boreas to check and annoy,

This belt will save food,
And soften your mood
As you care for the stock on the farm,
It will make you feel good
To have done what you could
To protect your dependents from harm.

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Come join then our ranks,
And you'll soon offer thanks
For the good things your work will produce.
Don't want, nor don't buy,
But earnestly try
To grow what you need for homeuse.

Doubtless you are asking why I have written all this, to point a moral or adorn a tale? Nay, but to point out the duty we owe to our needy brother whose home is as yet almost untouched by the beneficient hand of horticulture; the hundreds of thousands of hungering ones who anxiously wait the coming of the day when their longing for fruit shall be satisfied. We are not working simply for the interests of a few hundred nurserymen, but for the whole people of the state.

I have been repeatedly told that for selfish reasons this society does not wish to popularize its work. I have refused to believe this, because I can see no adequate reason for such a course; as nurserymen, their interests lie in the opposite direction. What are the petty emoluments and honors of office compared to the increase of this business which would occur by the widespread awakening of interest in horticulture among the farmers of Iowa. I believe the apparent difference arises from a feeling that we are legally and financially handicapped from undertaking anything along this line, but it does not satisfy my conscience to longer plead, the imitations of a defective law or meagerness of resources. The societies of other states are disseminating their work by county societies, the publication of fruit journals or the wider circulation of their reports. We, of the best state in the union, ought to no longer stay in the rear. It is therefore high time some plan was adopted which would secure to the citizens of the state all the benefits which ought to result from the work of its leading horticultural society.

THE PRESIDENT: The next paper is entitled, "School and the Farm," by R. C. Barrett, Superintendent of Public Instruction, of Des Moines, Iowa.

THE FARM AND THE SCHOOL.

RICHARD C. BARRETT, OSAGE.

What citizen of Iowa has not often said as he has traveled throughout the state in summer:

"Look up! the wide extended plain
Is billowy with its ripened grain,
And on the summer winds are rolled
Its waves of emerald and gold."

Emerson in Society and Solitude, says, "The first farmer was the first man, and all historic nobility rests on possession and use of land."

"Our rural ancestors with little blest,
Patient of labor when the end was rest,

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Indulg'd the day that hous'd their annual grain,
With feasts and off'rings, and a thankful strain."

"When tillage begins, other arts follow. 'The farmers, therefore,' says Webster, 'are the founders of human civilization."

That skilled farmers are as essential as skilled men in the professions is becoming apparent. The world at large is beginning to recognize that its growth, success and development depend primarily upon the farmer. His work is beginning to be accorded the standing it merits. This is indeed hopeful.

Schools of law, medicine, pharmacy, dentistry and pedagogy are necesary, but every experienced lawyer, doctor, pharmacist, dentist and teacher knows that the practice in office or school is important if the highest ends are to be attained.

A modern language may be learned in the schools from teacher and text-book, but the great proficiency in its use comes when the learner associates with those speaking the "mother tongue."

Hon. Theodore Roosevelt has well said: "No man ever really learned from books how to manage a governmental system. Books are adjuncts. and the statesman who has carefully studied them is far more apt to do good work than if he had not; but if he has never done anything but study books he will not be a statesman at all."

An agricultural college is an essential part of the school system, but the art of farming successfully is best learned on the farm and not in the college. It is on the farm that the boy learns to plow, sow, reap, thresh, market grain, and to feed and care for stock. It is here he learns to surmount obstacles and to place reliance upon himself, and not upon others. Responsibility is his from youth up. Here he forms habits of work, and with each duty performed he feels the consciousness of his own power. Upon the farm the child easily acquires an accurate knowledge of domestic animals, birds, flowers, trees and shrubs.

The National Government intends that the farmer shall be intelligent. For his benefit thousands of bulletins are printed and distributed annually at the expense of the Government, while colleges giving instruction in the sciences relating to agriculture and horticulture, have by the munificence of Congress, been provided in all sections of our country.

The states recognize the need of having trained farmers by appropriating annually large sums for the erection of buildings for the accommodation of students in agriculture and horticulture.

In 1898 it was reported by a statistician that 40 per cent. of the entire population of the United States were engaged in agriculture, while the remaining 60 per cent. were divided among 130 different occupations.

How to educate the great body of men who will devote themselves to farm life is a problem unsolved. For all farmers in a great state to be educated in a single college giving instruction in farm subjects is impossible. The fact that it is impossible in no way lessens the need of such instruction.

Our public schools are "of the people, by the people, and for the people" and in them should be taught those branches which strengthen, broaden and help the people.

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In New York the agricultural college is a part of Cornell University, and in addition to giving instruction in farm subjects to several hundred students, is trying the plan of "Nature Teaching." There are reasons for thinking it will prove successful and that the children of the farmer will be benefited.

The purpose of nature study is to train children to see, to observe carefully, and to be able to state accurately their observations. Too often the child sees but little of the world about him. If "the scientist is chiefly a man who sees better than his fellowmen," we should plan to open the eyes of every child in both town and country. Have him see living things;—see realities.

The study of farm crops, trees, flowers, plants, etc., is practical nature study, and our schools should no longer hesitate to teach this most practical kind of elementary science. To teach love of country, the fundamentals of government, economic laws, the causes of the Revolution, is well; but to so instruct a pupil that he will go forth from our schools with the desire and ability to make the barren spots of earth blossom with fruits and flowers is better. Public opinion is gradually tending toward the practical in courses of study.

In Missouri the new course of study provides for teachers and pupils a full outline of "Nature and Culture Study." In at least one state normal school students are now given instruction in farm subjects. But these agencies alone will not be able to attain the ends desired.

Our schools have been our pride. They have served to aid in a high degree in the general upbuilding of the commonwealth. If they are to be made still more efficient, they must be suited to present day conditions. The school for the farmer's child must be modernized. Constant changes are taking place in all kinds of work. Education is no exception. Expansion has come to us educationally, as well as territorially. New subjects are demanding recognition. There is a call for the readjustment of courses of study and methods of teaching. The old theory that education meant the accumulation of facts; the development of memory to the repression of other faculties, now finds only an occasional advocate. The kindergarten has almost revolutionized methods of teaching.

The child instead of being forced to learn lessons is now taught by a system which adapts itself to his needs. Present day courses of study and methods of teaching are recognizing the need of heart and hand, as well as head education.

Manual training in public schools is growing in public favor and is destined to become more important as a part of the school course. The teaching of the elements of agriculture and horticulture in rural schools was recently endorsed by one of the great teachers' associations of the state. The "Hand-Book for Iowa Schools," soon to be distributed for use, contains quite extended outlines in nature study.

To carry forward the new work will require new standards for teachers. Courses in state normal and other training schools for teachers will need modification. This has already been done in some states and teachers are entering upon the study of the new branches with zest. Their enthusiasm recalls the words: "Agriculture is the end and ultimation of civilization. Agriculture is civilization itself. Civilization is agriculture; agriculture is civilization; civilization and agriculture are one."

We must teach agriculture; it is the social, political and economic salvation of nations.

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When once our teachers can see the beauty in the blossoming field and golden grain, there will be less of the teaching that to be great in the eyes of the world man must be a poet, orator, statesman, or general. Less of:

"Bowed by the weight of centuries he leans
Upon his hoe and gazes on the ground,
A thing that grieves not and that never hopes,
Stolid and stunned, a brother to the ox."

There will be more of the teaching:

"God made man in His own image;
In the image of God made he him."

With Burns we will then say:

"What tho' on hamely fare we dine,
Wear hodden-gray, and a' that;
Gie fools their silks, and knaves their wine,
A mon's a mon, for a' that.
For a' that, and a' that,
Their tinsel show, and a' that;
The honest mon, tho' ne'er sae poor,
Is king o' men for a' that."

The question is presented: "Is it desirable to keep children upon the farm?" For an answer ask intelligent business and professional men. Hundreds who spent their youth amid rural scenes would gladly return. The only reason many do not do so is that their vitality has been so reduced by strenuous professional business or social life of the city as to wholly unfit them for even the most ordinary manual labor. The country boy with expanded chest, sturdy arms and legs, bright eyes, clear brain, healthy appetite, and conscious regard for that which is highest and best, will ever be a most potent factor in the solution of great problems political, economic, social, religious and national. The state should arrange to give him the best possible education. His opportunity to obtain an education should not be bounded by the lines of the sub-district. His teacher should be the best that can be obtained, and within a reasonable distance of his home should be a school of a higher order wherein he may receive instruction in advanced studies. In Iowa thirteen townships in twelve counties have provided these advanced schools for the better instruction of all in the township who are sufficiently advanced to be able to pursue the course.

Educational highways leading from the country home to our higher institutions of learning should be broadened and in some cases abandoned and others laid out. By establishing township high schools or township graded schools the children of the farm would reach the university or the other higher schools by that route, instead of that which passes through the city high schools.

There is a growing demand for better schools. Equal educational opportunities and privileges for our country boys and girls is the slogan.

At the close of the paper Mr. Barrett continued by sayin: Now, Mr. Chairman, I cannot forego this excellent opportunity to show to the members of the Horticultural Society what is being done in one township in Iowa

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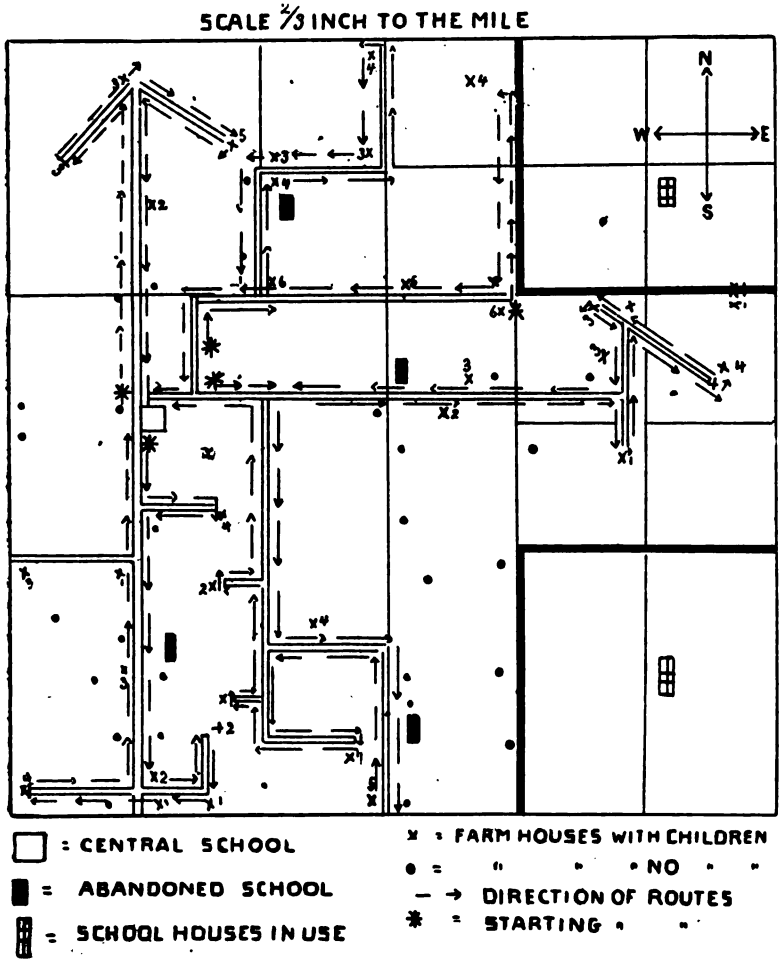
to give the country boys and girls a better opportunity to procure an education. This, gentlemen, (referring to map) represents Buffalo Center township six miles square. It is located in Winnebago county where your, Mr. Secor, resides. This small checkered portion is the village of Buffalo Center,

PLAT OF BUFFALO CENTER TOWNSHIP.


SCALE 2/3 INCH TO THE MILE
N
W
E
S
□ = CENTRAL SCHOOL
■ = ABANDONED SCHOOL
▮ = SCHOOL HOUSES IN USE
x = FARM HOUSES WITH CHILDREN
• = " " " NO " "
— → DIRECTION OF ROUTES
* = STARTING " "

(By "starting of routes" is meant where teams start. The most remote children are as a rule gathered first.)

and is one mile from the west township line. The township is in one single independent school district, governed by a board of five members. When this graded school was first started the people residing in the different parts of the township clamored for better privileges, and petitioned the board to transport their children to the village. This was done until today all of the

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children except those in the two remote districts, in the northeast and southeast portions of the township are conveyed. The central graded school is the solution of a great many problems of which I cannot now speak. I have recently visited the school and find there are no objections raised to the transportation of the children. The distances traveled by the hacks in gathering the children is as follows: Route 1, three and one-fourth miles; route 2, four and one-half miles; route 3, five and one-half miles; route 4, five and three-fourth miles; route 5, five and one-half miles, and route 6, six and one-fourth miles.

Ohio has had this system for a number of years. Massachusetts for years has also had this plan; they are even now transporting their children by the street railways from the remote part of the district into the city. In twenty-five counties children are transported in Iowa this winter, in nearly fifty different districts. I simply wanted to present, in this hasty way, this matter for your consideration.

A MEMBER: What is the cost of this method of transportaton?

ANSWER: The drivers all get thirty dollars a month except one man; they furnish covered and carpeted hacks.

A MEMBER: What is the size of this school?

ANSWER: They have eight teachers at this time in the township; the attendance on October 5, 1900, was 300.

QUESTION: What is the population of Buffalo Center?

ANSWER: Eight hundred seventy-five by the census of 1900.

A MEMBER: That requires the good roads movement?

ANSWER: Yes, sir; although it may seem a little visionary, later on there may be connected with this movement rural mail delivery.

A MEMBER: What is the comparative cost?

ANSWER: Mr. Johnson, the principal, says it has reduced the expenses per pupil from $1.95 to $1.48, besides giving better educational privileges.

A MEMBER: You consider this the present tendency in school work?

ANSWER: Yes, sir; Mr. Secor can speak of the plan from the standpoint of experience. He is a member of the school board in his own district where they are transporting children into the town of Forest City.

QUESTION: I would like to ask whether it increase the percentage of attendance?

ANSWER: It does. At Baldwin, in Jackson county, the average attendance is reported to have increased from six to eleven.

A MEMBER: Is the tax in outlying districts collected and paid over to the central board?

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ANSWER: Yes, sir; the whole township is under the control of one board.

MR. BARRETT: One thing you gentlemen would be interested in, the children are at home every night. This is a very important thing to be kept in mind.

QUESTION: Do children complain any of the length of the ride?

ANSWER: I have heard of no complaints.

MR. SECOR: I think they like the system pretty well in that township.

QUESTION: What about your district, is it satisfactory there?

ANSWER: Yes, it has given satisfaction. Some three years ago we began this thing in our district. We had actually built a new school house in the outlying end of the district; after keeping school there a while, we closed up that school house, thereby giving the children nine months schooling in the place of six and with less expense to the district than we paid before. I think we are not likely to go back to the old system. So far as our own district is concerned, I have not heard of any disposition to discontinue the plan. I believe they like it; it gives the children longer school; the country schools usually hold six or seven months in the year, while the town school is in session nine months. They have better school, better facilities, better teachers and everything better than they can possibly get in the country school.

PROF. PAMMEL: Will not this central high school idea have a tendency to increase the pay of teachers?

ANSWER: Yes.

QUESTION: Would it not have a tendency to elevate the whole tone of the teachers of the state?

ANSWER: I think so; very much indeed. I think that is one of the things the state lacks very materially; we have a good many poor teachers; and the children, a great many of them in our rural schools, I think, get the wrong start.

MR. VAN HOUTEN: I happened to be in Lee county a few years ago, and they tried the system there. I was amused and pleased to know that a young lady had entered into the competition of bringing these children to town, and had underbid everybody else. Inquiry developed that she was giving entire satisfaction. She had a carryall, covered spring wagon. She went into the town and attended high school herself. As Prof. Barrett said, I think the strongest criticism made against the Agricultural College, was the dormitory system. It has brought to the attention of parents the advisability, if possible, of having their chil-

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dren at home; at least in some home rather than having a great aggregation at one place.

A MEMBER: I would like to ask Mr. Secor if there has been any trouble about getting tho proper persons to carry the children?

ANSWER: That job is generally let to the lowest bidder; of course they want to be careful about the character of the person, and bind them up by a strict contract, so that they can be discharged at any time if they do not give satisfaction.

SUPT. BARRETT: When I visited Buffalo Center two weeks ago, I drove out between Forest City and Buffalo Center. The roads were very bad because of very heavy rains there. I passed a man stuck in the mud with a load of grain, yet over these same roads they were transporting children.

THURSDAY MORNING SESSION, 9: A. M.

THE PRESIDENT: Prof. Robertson has a little matter to present with reference to a memorial fund, about which he would like to speak to you.

PROF. ROBERTSON: Some of you were at our state meeting in Minnesota, and our Secretary asked me to present the matter to you gentlemen here. The proposition was made that a thousand dollar fund, called the Peter Gideon memorial fund, be established for horticultural and educational purposes; it was thought it would be better than a monument in stone form, and that this fund be put into the hands of the Board of Regents of our State University, and the interest from it be used as prizes to students in horticulture. At our meeting where the subject was presented, I think we had a subscription of $225.00 made. Mr. Gideon was well acquainted with a good many people and we all know what his work was. The thought was, that many of you probably would be interested in giving a little in the matter of establishing this fund, and so commemorating a good work of one interest in the same line. I shall be here until this evening and if any of you wish to offer anything in this line, I shall be very glad to take your names and receive anything in that way that you feel like giving. I should be glad to hear from any of you if you are inclined to give an expression in regard to the matter.

MAJ. HOLSINGER: I wish to speak of a matter that originated in the Missouri meeting, at the last session. A com-

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mittee was appointed with the view of taking part in the Pan American Exposition during the fall. It is proposed that the horticulturists from the four states, Missouri, Iowa, Kansas and Nebraska should arrange to go in a body to the Pan American Exposition. The proposition is to go up through the fruit region of Michigan and on to Buffalo, taking in western New York. I merely call attention to this now. I have had the good fortune of taking in several of these excursions. I remember one time going to the American Pomological Society, held in California. I have also been to New Orleans. These excursions are very pleasant and our interests are identical. The Missouri society have appointed a committee of three. I will take the matter up in the Kansas society. I will say here, that our Kansas Horticultural Society meets during the holidays and we would be pleased to have some of you people there.

THE PRESIDENT: Gentlemen, in this connection I would say that we have with us this morning one of the Special Commissioners of the Pan American Exposition, Mr. H. T. Rucker, and we would be pleased to hear from him.

MR. RUCKER: I thank you for giving me an opportunity to say a word and giving you an idea of the Pan American Exposition at Buffalo. I was pleased to hear the gentleman from Missouri speak of his trips. I find that is the case wherever I go. Week before last I visited some eighteen live stock associations that met in Chicago. They all voted to hold a meeting in Buffalo next year. The National Good Roads Convention and the Irrigation Congress that met there a few weeks ago have voted to hold their annual session in Buffalo next year. In regard to the Pan American Exposition, it is unique in this: That the Western Hemisphere, North and South America, Cuba, Puerto Rico and the Philippines only will take part. There will be thousands of Europeans to visit our exposition and see what has been done in the last century on the Western Hemisphere; it will be a grand object lesson. It may seem extravigant for me to say that I think it will excel other expositions, all others, in many respects; but I firmly believe that. I have been connected with three or four of them. The Chicago Exposition, and the New York office of the Paris Exposition I have just closed, and so I think I have had some chance for making a comparison. Of course we will not have the great area they had at Chicago; they had 700 acres, we will have 400. So far as buildings are concerned, Chicago people do not like to hear me say that, but it is a fact and you will bear

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me out when you see them, they will be superior to those in Chicago. They are not all white. We have a red tile roof and the Spanish Venetian style; we do that because the Central American and South American Republics will be with us. One building will be in straw color, the agricultural building. They have worked on it a good many years to get coloring that would preserve on staff work and in that way the buildings will be more artistic, more beautiful to the eye and easier to the eye. The South American Republics have all been invited and accepted, except two or three. They are spending a great deal of money in preparing and making exhibits and they are coming here in full force. I do hope your Horticultural Society will take some steps with the view of exhibiting your interests at the Exposition. I can not conceive of anything that would be of greater advantage to you. Expositions are simply milestones in our progress. I hope this Society will take some cognizance of these facts; at least, I would like to see this great train load of horticulturists come to Buffalo and bring your products there and hope that you may have a representation worthy of the great state of Iowa. I thank you gentlemen.

ELMER REEVES: It would hardly seem right to let the remarks of Prof. Robertson pass without remarks upon our part. I want to say, that I believe the method proposed for remembering the work of Mr. Gideon is more fitting than any monument possibly can be. Those who can I believe had better bend their efforts towards increasing this fund.

THE PRESIDENT: We will now listen to the report of the committee on the president's address.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Your committee to whom was referred the annual address of President Gardner, having considered its recommendations, respectfully report:

First. We fully concur in the recommendation that rule ninth in reference to the election of the committee to have charge of our experiment work be changed.

We recommend that rule ninth be stricken out and the following substituted in its place:

Rule Ninth. The experiment work of this society shall be in charge of a supervising committee of three to be elected by the Board of Directors, each member of this committee shall serve three years. One shall be elected at each annual meeting at which time vacancies in the committee shall be filled if any exist. The committee may annually elect its own chairman who shall

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keep a full record of the work and the expenditures of the committee, and shall report the same in writing to the Board of Directors at their annual winter meeting.

We recommend that rule eleventh be stricken out and the following inserted in its place:

Rule Eleventh. It shall be the duty of the supervising committee to make personal examination of the condition of the work at each station once in each year. They shall report their observations in their annual report.

As to the recommendation relative to holding a formal summer meeting on the grounds of the State Agricultural Society during its annual fair, your committee are not prepared to concur, but believe the interests of horticulture might be materially advanced by holding a summer meeting at the Agricultural College, at one of the society experiment stations or at some other point where new fruits or new methods might be advantageously studied. The time and place of such meeting to be fixed by the Board of Directors. Your committee fully concur in the president's recommendation that the Board of Directors be authorized to offer a reasonable amount of money in special premiums for exhibits of new and promising fruits originated within the state. All of which is respectfully submitted,

C. L. WATROUS,
F. M. POWELL,
EUGENE SECOR.

Upon motion, report was adopted.

THE PRESIDENT: We will now hear the report of the committee on the Treasurer's report.

REPORT OF COMMITTEE ON TREASURER'S REPORT.

Your committee appointed to check over the accounts and vouchers of the treasurer, beg leave to report that they have compared the books and accounts of the treasurer with the vouchers submitted by him and find the report made by him to the society to be correct and the amount in his hands as shown by the books, $631.34, was shown to be in the bank by certificate of deposit.

ELMER REEVES,
M. J. WRAGG,
M. E. HINKLEY.

Upon motion, same was approved.

THE PRESIDENT: We will listen to the report of the committee on the Secretary's report.

REPORT OF COMMITTEE ON SECRETARY'S REPORT.

Your committee on Secretary's report respectfully submits the following:

We commend the efforts made along the line of securing an herbarium for the society, and trust that when we shall have acquired permanent quarters,

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that that work may be carried on vigorously along lines of its greatest usefullness to this society.

We approve the suggestion and recommend that the distribution to public and school libraries be continued until all surplus volumes of our report are disposed of.

We have examined the vouchers and accounts submitted and find the total disbursements $351.80, total credits $516.18, leaving cash to balance $164.38.

SILAS WILSON,
F. E. PEASE,
N. K. FLUKE,
Committee.

THE PRESIDENT: We will hear the report of the committee on premiums.

REPORT OF COMMITTEE ON REWARDS.

Your committee would report as follows:

Best collections in central district of not less than fifteen or more than twenty varieties:

B. Stuart, first premium	$15.00
J. M. Chaffee, second premium	10.00

ON PLATES.

B. Stuart, first on Northern Spy, Minkler, Ben Davis, Stark, Lansingburg, Walbridge, Roman Stem, Golden Russett, Utter's Red, Perry Russett, Grimes Golden, Fameuse, Missouri Pippin	3.25
To J. M. Chaffee, first on Willow Twig, Jonathan, Vanderver Pippin, Paradise Winter Sweet, Pewaukee, Red Romanite	1.50
To F. O. Harrington, first on Windsor	.25

In southern district, only two entries made, of three varieties, one plate of each.

To C. G. Blodgett, first on plate, Red Romanite and Minkler	$ .50
To A. Branson, first on plate of Black Annette	.25

COLLECTION OF SEEDLINGS.

B. Stuart, first premium	5.00
A. Branson, second premium	3.50

Four plates entered by each.

Best seedling entered for $15.00 premium. We consider Underwood No. 4, worthy of propagation and entitled to premium.

We also find a nice display by W. G. Gano, of Parkville, Missouri, of the following varieties: Arkansas Black, Gano, Mammoth Black Twig, York, Stark, Ingram, Huntsman, Winesap, Ben Davis, Mann, Tulpahocken, Nixon, Jonathan, Grimes, Given. Also some beautiful models in clay reproductions of peaches of Mr. Gano's by Miss Rubert, of Junction City, Kansas.

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One plate of apple (seedlings) by Frank Holsinger that has good quality, also an exhibit of six plates of pears by M. J. Graham, of Adel, Iowa, that are worthy of attention of the society.

Very respectfully submitted by your committee,

A. J. EDWARDS.
W. G. GANO.
FRANK HOLSINGER.
Committee.

THE PRESIDENT: Mr. Secor, will you make your report as delegate to Southern Minnesota?

REPORT OF DELEGATE TO SOUTHERN MINNESOTA SOCIETY.

EUGENE SECOR, FOREST CITY.

The meeting which your delegate had the honor of attending was held at Austin, November 20th to 22nd inclusive.

This society is composed of the horticulturists of three counties in the southern tier of Minnesota, namely: Freeborn, Mower and Fillmore. It is auxiliary to the state society and its transactions are published in the annual volume.

Situated as this district is, adjoining us on the north, the problems which confront them are so like a portion of our own state that their experiences and discussions are of interest and value to many of us.

The meeting was not largely attended but many papers were read which showed experience and culture.

There were perhaps twenty varieties of apples on exhibition, among them being Patten's Greening, Malinda, Talman Sweet, Northwestern Greening, Walbridge, Peerless and Plumb's Cider. Of course Wealthy was in evidence. Northwestern Greening seems to be a promising kind for the north, and Malinda is quite generally planted. With these winter varieties succeeding quite well the future of orcharding in Minnesota is not so gloomy as one might imagine. The annual snowfall, which they are reasonably sure of, removes one discouraging feature which south and central Iowa have to settle with.

O. F. Brand, of Faribault, gave a very interesting account of his thirty-seven years' work in the state as a horticulturist. It is such veterans as he, J. S. Harris, Mr. Lord and others, who have kept the banner of horticultural progress aloft through discouragements and temporary failures until Minnesota is almost as well known for her fruit as more favored states. Whoever saw the magnificient display at the Minnesota State Fair last fall will appreciate the force of this just acknowledgement.

Mr. Harris was also present and contributed largely to the interest and success of the meeting.

Vineyards were reported mostly killed. In the discussion of this subject it was brought out by Mr. Kimball, of Austin, that grapevines laid down and covered with earth only were not safe. He recommended covering with

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mulch also. If this practice will insure vines it would seem that mulching orchard and other trees in the fall might solve the problem of root-killing which proved so fatal over such a large area two years ago.

Mr. Peck gave a very instructive illustrated lecture on growing the potato. He regarded the seed as of prime importance to a good crop. He saved his seed when digging, and only from hills containing mature and perfect tubers —never planted small ones. He claimed if this practice were followed potatoes would never deteriorate but rather improve. He showed potatoes and explained why some were ill-shaped. His rotation was clover, potatoes, corn, wheat, oats or barley, and seed with clover. Cultivated with the harrow as long as he could and then used Planet Junior cultivator.

Mrs. Freeman presented a very able paper on "How to keep the boys on the farm." She recommended nature study in the public schools in order to cultivate the habit of observation. "Get a boy thinking and he'll do the rest." "Make farm life more attractive," she said, "and let the boy do some things his own way whether it be the best or not."

The culture of gladiolus was interestingly presented by Rev. Mr. Mosher, of Albert Lea, and a good deal of information was brought out about this easily raised flower, its beauty, desirability, etc. I shall expect to see an increased interest in gladiolus as a result of his lecture.

Another talk on the injury done to horticulture and tree-planters by the inexperienced and unscrupulous agents sent out by nurserymen created a good deal of discussion. It was the contention of the speaker that only such men should be allowed to sell trees as possessed the necessary information about varieties and orchard sites to instruct the uninformed planter. He recommended a license for tree agents.

Your delegate was royally treated and he learned many valuable lessons.

A MEMBER: What about the Peerless apple?

MR. SECOR: It is rather a late fall apple; it is not really a winter apple.

MR. WATROUS: It would be still earlier down here. You hardly ever see it on the table of the society up there, in their winter exhibitions, unless it is kept in cold storage. The Northwestern Greening grows beautifully up there

A MEMBER: The Peerless is something like the Wealthy?

MR. PATTEN: My impression is it is not later than the Wealthy. The Peerless is a very vigorous, beautiful tree. Did you see the specimens of the Peerless at Austin?

MR. SECOR: Yes, I believe that is mentioned in my report.

MR. REEVES: Do you know the condition they were in; I do not remember clearly now.

ANSWER: Yes, I remember quite distinctly they were in appearance long past their season.

A MEMBER: We have them in Mahaska county. I do not consider them any later than the Wealthy.

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MR. SECOR: We have the opinion now, in our county, that it is only a fall apple; perhaps no better than many others we have.

A MEMBER: As the remarkable fruit displayed at the Minnesota Fair has been mentioned, I think it is well to ask how this display has been obtained.

ANSWER: I think they had some five thousand plates of fruit displayed there; something over that, that was brought together by a sweepstake premium, awarded to the best display of the county. Any man that had a horse and buggy could collect anything nice that he saw and take it to the fair and get a sweepstake for his county. The only conditions imposed were, that in the display of the fruit he would mention from whom he got it. For instance, he would tag "Wealthy," grown by such a person.

Mr. Watrous at this juncture brought up the matter of the pure food law and his observations as to such a law in Minnesota. After some discussion as to the best means to reach the desired legislation the legislative committee now in existence, upon motion was continued as constituted for the ensuing year:

THE PRESIDENT: We will hear a paper on "Pollination of Fruits" by Professor A. T. Erwin, of Ames.

POLLINATION OF FRUITS.

BY A. T. ERWIN, AMES.

I have been anticipated by some of your members. Pollination in plum and strawberry culture has been emphasized already, hence I need not dwell further on its importance.

Sex as a factor in plants. It is a peculiar fact that the existence of sex among animals and the laws governing it have been known among animals for several hundred years, yet among plants this factor has only been fully recognized within the last century.

There are two methods of propagating plants, seeds and cuttings, or the sexual and asexual; viewed from the economy of the plant, the latter is cheaper, quicker and more direct. With seed, the plant must spend a good part of the season growing special sexual organs for this work. Two individuals are concerned instead of one as in the other case; this also brings in the element of chance as these two individuals of opposite sex may fail to come together. With the cutting any branch will do, only one individual is concerned and the work is direct, hence if mere perpetuation of species was the only object, sex would be a useless factor among plants. There are two strong reasons, however, for its existence. First. Through the union of dissimilar individuals new forms are created and the species is rejuvinated. (Darwin.) Second. The fleshy portion which we term the fruit is a direct

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result of the growth and development of the sexual organs—hence no sex no fruit.

In nature we find many devices for the cross pollination of fruit, the most important of these natural agencies are insects and wind. In our prairie state with its prevailing winds, bees are probably not such an important factor as in other places. Even among those varieties in which this cross fertilization is not necessary a better developed and larger sized fruit is attained when it is done. Practical results in these lines have been attained with the plum, strawberry and tomato. Pollenizers accepting the fact that cross pollenizing is beneficial and hence necessary the subject of pollenizers is in order. In this selection three points are to be born in mind. First. There are certain relationships or botanical affinities among plants, outside of which the pollen is not receptive. Second. Certain varieties are heavy pollen bearers, others scanty. Third. We must work between varieties which blossom about the same time. For example, the Bederwood strawberry is well known as a good pollen producer, most of our European grape hybrids are scanty producers. Some expensive lessons have been learned in planting large blocks of one variety of the Baldwin in the East and the Ben Davis in the West.

As a distributor of pollen it behooves us to protect our little friend, the bee, and not poison him by spraying before the petals fall. Specialization and the division of labor is the law of development along all lines, so it is with fruits, one variety produces an abundance of pollen, another little, a step farther and we have a variety which comes only the one sex. Bi-sexuality. This stage has already been reached in some varieties of the grape and strawberry. Certainly the plant which can concentrate all its energies upon one act should do better work than the one which has a double burden to bear. Hence in the further development and improvement of our plums and other fruit we believe that bi-sexuality and cross pollenation will become stronger and more important factors.

MR. REEVES: What proportion of the pollination is performed by the honey bee?

PROF. ERWIN: I do not think any one could answer that question definitely, Mr. Reeves, for the reason that you might plant two varieties close together and in that case a little wind would shake the branches———

MR. REEVES: The point I am trying to get at is, whether the bee is the insect that does the most work or whether there is some other insect that has something to do with it.

PROF. ERWIN: In regard to the apple, the bee does it; nine-tenths of it. The bee and incidentally the wind.

MR. BURNAP: How about the strawberry?

ANSWER: I think the same thing is true there, only not in such a large degree as in the apple.

MR. BURNAP: I ask the question because I am a bee man and a strawberry man, both.

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MR. FLUKE: I do not think bees have very much to do with pollination of strawberries; there are other insects though that do. I think the strawberry is pollinized to a great degree by a little midget that is in among the plants, that you find crawling among the plants, I think they do more work than almost anything else. I don't know what you call it; a small fly.

A MEMBER: There is some incident connected with this subject that would make me believe that almost all our strawberry blossoms, especially the bi-sexual varieties, have pollination enough in themselves if properly stirred. If the flower remains still and there is no wind or insects, they will not form fruit. I think almost all of our varieties of strawberries will fertilize themselves, if the conditions are favorable, without some of the other varieties mixed in.

MR. PATTEN: In view of what Mr. Erwin has said in reference to the pollination of the strawberry, it looks to me there is a practical side to this question that can be made plain to all, even to a farmer, and the only thing we need, it seems to me, is the coalition of a suitable number of facts to form something like a science in the matter of pollination of strawberries. He referred to the fact of one variety being more acceptable to another variety than others; that is, two varieties had more affinity towards each other than others. Now, I have noticed,—I have the Green Prolific and the Red Jacket, they were abundant pollinizers where the plants run together between the rows, where the pollination was perfect, and in that case the Green Prolific was the most perfect, largest and most abundant that I ever saw; I never saw anything like it. Another instance of the Green Prolific was that of the Wilson. I think they were the largest Green Prolific strawberry and the most perfect in every respeet, I ever saw. The point is just here: It is for our experiment stations to take up this kind of work and demonstrate what varieties would produce the best results along that line.

JOHN FORSTER: I have always advocated the bee as a great pollenizer. Of late I have made up my mind, they do not have a great deal to do with it. For instance, you plant red, white and yellow corn together and you will get calico. In the spring of the year, when rye comes in bloom, you will notice up in the draws, the early frost has killed the bloom, and there you will have no grain. You have heard them say, that if you kill the bumble-bees, you will have no clover; if you have a heavy crop of clover, you will have bumble-bees to contend with. You take

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apple trees in bloom,—the bee is something very careful; we have nothing that works as the bee does. They take the pollen off and embrace it firmly on the leg and they take it home and scarcely loose any of it, and I do not believe that we should put too much emphasis on the bees.

PROFESSOR ROBERTON: Just in that line, I would suggest that Mr. Bush in his in-door growing raises a great many cucmbers. He used to keep the bees in there and found that he did not get good crops. He now simply goes along and thumps them with a stick at the time that they ought to pollinate and discards the bees; he simply discarded the bee and used his club.

W. S. FULTZ: I have been a bee-keeper for pretty nearly twenty years. I have made this question a study. It is too big a question to discuss now; it would take an hour or two; twenty years ago we had a bee-keepers' association in my township. I have the records there. That record shows we had eight hundred stands of bees in the township. In 1895 I took the census of the township and found there were one hundred and thirty nine stands of bees in the township. In 1897 I again took the census as assessor for the crop service of Iowa. I found one hundred and three stands of bees in the township. Last winter there were seventy stands of bees in the township. When we had one hundred and three stands of bees, I owned one-third of them. This question is going to solve itself. I have had bees and I have made a study of them the same as I have of horticulture. I have satisfied myself that the bees have no influence upon the crop of fruit. We have raised as good crops of fruit for the last twenty years as we ever did. I know my neighbors that haven't a bee have just as good a crop of fruit as I have. When I first got the Forest Rose plum at the college—it was in 1885—they bloomed first in 1889; the other trees around them bloomed and they all bore fruit but the Forest Rose. My bees worked on them strongly. The Forest plum never fruited until it stood there eleven years. Now it bears fruit almost every year. Now, age or something else has enabled it to furnish pollen for its own use.

A MEMBER: Did you take the census of the bumble bees?

ANSWER: When I was a boy I thought I never had fun unless I stirred up a half dozen bumble bees' nests. We have plenty of clover all over our county now, and we haven't any bumble bees.

SECRETARY: I think sometimes that we put a little too much stress on what is called scientific investigation, without really

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getting at the truth of the matter. I am a friend of the bee, believe it does a great deal of good work but think that weather conditions have more to do with the fertilization of the flower than the bee has. If there is bright, dry, sunny weather with a good air motion, that is all that is necessary. The old notion of placing bees in the greenhouse to fertilize cucumbers and tomatoes, is obsolete, as mentioned by Professor Robertson; by tapping the support on which the plants are tied, you will get all the fertilization that is necessary. Plants will not set perfect fruit if not properly fertilized, and air motion is all that is needed, in most cases, when the pollen is ready to be carried and the pistils are in a receptive condition.

As to that "Clover Chestnut"—You always locate a fish story a long way from home, and that Australian clover vs. the bee—is one of them. I do not think the bee has much to do with it; have been raising clover for years and would not give a cent for all the bees in the state for that purpose. The weather conditions at the time the clover is in bloom will determine the crop. If you will take a note book and go into your clover field when it is in bloom, and observe closely on a few rods square the number of bees that visit it in a given time, and the number of flowers in which they insert their bills, or follow an active bee for awhile to see how much of that sort of work it really does; then make a computation of the number of seeds in a bushel of clover, and four to six times that to the acre (and you know that crops of that size are not in bloom very long) and I think your faith will be rudely shaken as to value the bumble bee in the clover field. I am, however, willing to give it credit for all the good it does.

MR. REEVES: This matter of bumble-bees fertilizing clover, and the honey bee also, we have been picking the old idea over and over again. Many of us never take the time to follow the bees and see what they do. On the strawberries, you watch these little insects and see how they compare with the number of bees in your strawberries. There are many other things we consider to be scientific,—let us open our eyes and see whether science has led us in the right direction. We hear people say that birds carry the seeds; they carry them in their bills and drop them in that way; but if the bird eats a seed, that seed is done for. There are a great many other things, such as the laying of eggs by insects, on the apple, and so on. Many of these things we have accepted for what we supposed to be scientific knowledge, and never looked into it ourselves. We can get a good deal of truth sometimes, if we will really spend a little time.

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MR. LATHROP: I have a resolution I would like to offer. When the first appropriation was made, I think there was a provision in the law that this society should promote the growth of local societies. We had a great many county societies spring up and live a short time and then went down. I think there never was but one local society that came for any financial aid. It appears to me we have carried out now the idea that was embodied in that law. Now, I would like to offer the following resolution:

Resolved, That we request and instruct the Board of Directors of the Iowa State Horticultural Society to make the annual appropriation to each one of the four district societies two hundred dollars ($200) instead of one hundred and fifty dollars ($150) as at present, and that the said increase shall begin now, and shall be continued yearly until further ordered by this society.

After extensive discussion of the resolution, as read, in which the methods of the application of the resources now received under the present law were questioned or approved by the different members of the society, C. L. Watrous moved that the resolution be referred to the Board of Directors, with the recommendation that they make the appropriation therein provided for, if, in their opinion, the funds now available by the society, should warrant such action. The motion prevailed.

The following resolution was then read and passed without opposition:

Resolved, That the best interests of this society need a medium through which we can reach our members and others interested in the horticultural development of our state, therefore we endorse the Fruitman as the official paper of this society, with the understanding that at least two columns of each issue may be used by our secretary for the furtherance of the interests of horticultural work in Iowa.

THURSDAY AFTERNOON, 2 P. M.

THE PRESIDENT: Mr. F. O. Harrington would like to say a few words with reference to an apple he has grown, and he may have the opportunity now.

MR. HARRINGTON: I have taken root grafts of this apple from J. S. Plumb, of Wisconsin. I understand it is not very much scattered yet, but has proven very valuable there. I waited to see how it would develop; it is an annual bearer and bears very heavily. It has one or two faults, commercially speaking, its

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season being from the first of November until January, but it is very valuable for an apple for home use or near market. While being a slow grower, it shows itself to be exceedingly hardy.

THE PRESIDENT: What county are you in?

ANSWER: In Iowa county. I have no trees of these for sale and I do not know where you can obtain the tree. If the people know what it is, it is not going to be a great while before they will have it. I simply speak of it to draw the attention of the people to it; it is a sort well worthy of trial in other parts of the state. It has certainly been very profitable with me. The name as originally given was Windsor Chief. Now, the American Pomological Society simply calls it Windsor. I have brought the apples here with the intention that you might test them, cut them and try the quality of them. It has ripened up rather prematurely, as many of our apples have done, and some of them are over ripe.

MR. PATTEN: I believe it originated in Dana county Wisconsin.

C. L. WATROUS: As there seems to be a sort of a lull now, some of us have been talking about devoting our evenings here in the future for committee work and personal conference, and in order to bring the matter up I move that the secretary be instructed to make up the program for next year, excluding evening sessions, except for the purpose of electing officers. The motion prevailed.

Upon the call of the president, Mr. Bomberger read his report as a member of the committee, relating to the Agricultural Society as follows:

Your committee to whom was referred the matter of improvements needed on the grounds of the state fair would respectfully report:

That a new hall of more artistic design be built twice the size of the present structure, or that it be enlarged and completed, lined with boards and painted with suitable colors, or frescoed so that it could be decorated in a more artistic manner, and that a sufficient appropriation be made for that purpose.

That the premiums offered on plants and flowers be increased one hundred per cent in both the amateur and professional lists.

That the premiums on fruits should be twice as large as those offered in the year 1900.

That the horticultural exhibit be placed permanently under the control of the State Horticultural Society. That plans be made for laying the grounds out so as to give proper landscape effect, and that such ornamentation be considered in all future improvements on the grounds.

That the Department of Agriculture award premiums for display of flower beds on the grounds.

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That the Horticultural Society appoint a committee of five members to present this matter to the Department of Agriculture.

W. M. BOMBERGER,
C. G. PATTEN,
C. L. WATROUS,
L. H. PAMMEL,
Committee.

After some discussion as to the propriety of one of the clauses contained in the report as read, a motion to adopt prevailed.

THE PRESIDENT: We will now hear a paper entitled, "Correct Information," by W. M. Bomberger, of Harlan.

ARTICLE "2" OF THE I. S. H. SOCIETY.

BY W. M. BOMBERGER, HARLAN.

It is well for officers and members to read and give attention to the clear statement of the true object of the existence of this Society. The Code of 1873 gives the organization, by an act of legislature, the right of existence, hedged about by requirements and imposes some obligations. The revision of 1897 is a more compact condensation of the original laws, and varies but little as to details and none as to object. The magnificent appropriation of $2,500 is given annually to be expended for work; section 1670 alone gives the object of the passage of the law and the use of that sum. It reads as follows, after making provisions in another section for the organization of the parent society: "District and County Societies. The society shall encourage the organization of district and county societies, giving them representation therein, and in every way further fruit and tree growing interests of the state."

It will be noted here that the first and paramount idea and duty of the parent society, in the minds of the legislators, was extension of organization and representation. Further than above there is no other duty imposed or hint suggested by statute. Now, the founders of this society were confronted with this idea and imposed obligation that they must organize societies where they can, and give representation in the state society. With this idea in mind, as they were organized and had adopted a constitution and by-laws, we have from them a clear enunciation of what the true object should be of this organization, and the sub-organizations auxilary to it. They declared, enrolled and subscribed their consent, and by unanimous vote, that the object of this society and its sub-organizations that has representations in it, "shall be the promotion and encouragement of horticulture and arboriculture, by the collection and dissemination of correct information concerning the cultivation of such fruits, flowers and trees, both decideous and evergreen as are adapted to the soils and climate of Iowa." Added to duty of organization, they imposed a strictly but broadly laid obligation of gathering and giving out facts, that they wanted these given out correctly, as they related to our work.

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To gather correct information and give it out is understood to be our proper work, and the highest ideal of the work we should be engaged in.

According to the idea as expressed in this second section of our constitution, the highest object we can have, and our strictly statuary and constitutional duty, is educational; this duty is to be exercised in this state for the general public good.

KIND OF FACTS, WHERE TO BE APPLIED, ARE DEFINITELY STATED.

The societies, including the parent organization, are the agencies; we, the members, their life power. Our exclusive and great work then is purely educational, and so arranged definitely by our constitution. In all our work we are, and should be educators, and give correct information. Education is the main-spring of all modern progress, and the present expansion of human effort. Education has worked marvels; the common school, the college, the church, innumerable societies are the real sources and secret power of the great uplift that is going on in every department of human effort, and it seems as though the public now lives in the spirit of self-sacrifice to support these efforts to train the mind, body, hand and heart. It truly seems that the founders of this society almost had a prophetic knowledge when they placed educational work as the first and only object of this society. We can, then, as societies, add to happiness and general progress by the betterment of all these conditions.

The kind of information we are required to give is that which is correct. This implies that there is a possibility of giving out another kind. Error or truth, can inadvertly, or intentionly, be easily given out because facts are of local application, and if given currency away from the home of the plants, or where conditions are dissimilar to where the facts apply, they may become incorrect. Exclusive attention to a few ideas relating in the work, or great successes in spots where fruits, or trees, or plant life is made widely current in meetings or reports, through society agencies, and that are read away from proper environment, can be made correct or incorrect, if horticultural agitation runs in lines of boom crops, variety agitation, or in line of theories unproven or to be proven, after the uncertain and unknown; and should we attempt to spread this information over state wide territory it is wholly the reverse of helpfulness, and if the ideas are local, and apply to local operations, or introducing new methods and new fruits, which succeed under different conditions, the damage may be great, and statements misleading, greater than if no information were given out and more harmful. It is possible to hold a horticultural meeting and hold it enthusiastically, and let it so run as to be of some benefit to those in session, and yet not be of any value at all to the public and the taxpayer that gives us our very appropriation. It is better to think out illustrations in this line than discuss them here in public meeting.

The rapid sweep of the "passenger and freight train" from state line to state line in a few hours, the constantly moving solicitor, incident of the modern nursery; catalogues far from their homes, by every fireside, pressing varieties only, and the tendency for information to go out without any hint of conditions from whence they come, only tends to confusion and to continue repetition in planting along lines of popular agitation with constant varying of method and management, which leads to horticultural misfits, and

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often most of such planting is done on grounds purely experimental, to see if this or that horticultural curio is what it is claimed, when it is too often only an old variety picked out of the horticultural scrap pile of the dead past, that we all had supposed was in "innocous desuetude." New things that are most widely and quickly disseminated do greater damage and increase misfits, confuse theories and misapplied methods over a wide territory, although the plants may be perfectly good under local home management. It is and would be a narrow use of this society, or its auxilaries, to make itself but an adjunct in any way to tree and plant traffic, making the burden of our work in form of tree and variety advertisement, directly or indirectly. And our experiment stations have such a tendency.

Variety test and dissemination has been going on in Iowa for half a century, this gives available experience, considerable has gone out and is now even lost with old and early orchards and fruit plantations, and that which is just a memory now, but available, should be noted and made into permanent record and placed in accessible form for the grower and planter and public. These experiences should be turned back to where they belong. This is and should be our main and constant work as we have this obligation imposed on us by our constitution.

Every part of our territory, even to the township and remotest section, should, as far as possible, now be platted, and our membership extend to every local point in the state, and data recorded and made available so it would be a help to those wanting and needing such information under similar conditions. One section should not thrust itself with peculiar local conditions onto another.. Exclusive work of specialists should not be forced on sections where it does not apply to add only more to the confusion now in our state that arises from the incident of tree and plant traffic, in doing business away from home and talking and placing varieties where they do not apply.

Planting in east Iowa has been going on largely over the space of forty to fifty years, even more in places, and in the west half of the state from eighteen to thirty years. Tests and trials more recently made are also going on on the grounds of tens of thousands of homes in every part of the state. Many orchards are easily accessible and the particular facts and the general principles are easily obtainable from these sources without saying one word about variety. If all the means and money used in the past history of this society were added to the personal efforts of its members in giving us these facts as correct information to turn back to the state would we not now be better off? Plant introduction is only a very small incident in the whole line of horticultural work, and yet the reports, our discussions, and the information going out in every shade of opinion, has been given out on few lines and they have been misleading and positively detrimental to a a correct knowledge and test.

Now to see the utter uselessness of such a test and trial, and the utter paucity of fair and unbiased testimony to the value of fruit, to give it a true character so as to invite public interest and confidence, or repel it. Now let us give this kind of trial and test only a cursory glance. Early in the history of the state when the west half was new and unplanted and much of the north was unplanted, as well as untried, as many sections in Dakota or most of it now. Then it was necessary to localize a few points in a terri-

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tory and try a few varieties, it had value, but now in this state every section is settled, every township is filled with homes and practically no area of it that has not had some kind of trial and test. New fruits are sold by catalogue and by agent in every county, and every farm house and village lot is in close touch with the modern nursery incident, the solicitor. As soon as new fruits can be gotten they are tested by the public on a large scale and little or no fruits, of value for test, remain untested by the public at large. The purchase of this same novelty stock and its introductions by our stations is the same purchased by the public, and, what then is the use of this expensive disbursement of funds for a little information from limited sources.

The general character of new fruit, good, bad, or varying with local adaptation, is given by five or six managements and on only a few small plots of grounds. If this society, or any individual, wants any correct information and true knowledge of fruits, it is better based on what can be secured from a hundred or more points in a hundred counties under hundreds of managements and on a large variety of soils and conditions of Iowa climate. The expensive test and machinery of the experiment stations, that have absorbed about $3,500 of our funds for this useless and limited effort, cannot be above cloud when there are blocks of nursery stock on the same grounds for sale; commercially in nursery rows, or in cellars, or under contract in spring trenches.

Political maneuvering of station keepers do not in any way materially increase the confidence of this society in the facts that go out as to this or that fruit. Information from one or two hundred grounds and managements that are in hands of gardeners, enthusiastic amateurs who give more time than any other to it, farmers, fruit growers as well as information from nearly one hundred nurserymen on their grounds in this state, would be far better. I would ask here how much cheaper could we securing this information, as it can be gotten through the mail, and would not involve any such great expense as we are now at as a society. Experiments have been only in a very limited range on apple, plum and cherry and other fruits, trees and other plants are neglected in the test. As things now stand, after what has been inaugurated as a great reform, we have no prospects of anything better than in the past.

Take on the other hand the manufacture of variety with view of dissemination. This is strictly work for an experiment station and is not authorized by law, in the statutes of Iowa or our constitution. We have a United States experiment station in this state, established under the Hatch bill, and it is run by the general government and established at Ames, Iowa. This is a line of work belonging to that station. And there is no shadow, or thought in any law or statute, or the constitution of this society, to assume such work, or any work, that really belongs to the experiment station at Ames. It has been repeatedly urged, and motions have been made, that this society should set apart large sums, as much as half of the appropriation for experimental purposes, which has been expended in importing plants, buying nursery stock and distributing it among selected members, and the manufacturing of varieties by breeding or crossing fruits. There is no such obligation in any law governing us, or any hint of such purposes even in the enacting clauses of acts passed by the legislature that such is our work.

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Rule No. 17, on page 19, is not in any way necessary or required by any law passed. We have no such obligation whatever. If this money was used to teach the public to experiment and to do general educational work in growing new fruits it would be in a measure proper. The paying of small personal salaries for conducting experiments that aggregate to hundreds of dollars could be expended in organizing and maintaining county and district societies, but is now expended in making experiments and buying nursery stock.

There is another feature about the expenditure of our funds that diverts it into wrong channels. We refer to placing under salary persons that are under single and double salary at Ames, and our paying considerable bills in and to and through that institution. The resources of this organization are limited and meager in comparisons with those at Ames. This statement is made only as a statement of fact and business. We wish nothing understood but what we are willing to co-operate with Ames in work of any character, with utmost courtesy, but this society has business principles involved that are just and honorable; and, well paid and efficient help at that place can afford, in the light of the spirit of self sacrifice of many members in this society, to enter our work with full hands and give us financial support, and the moneys paid in salaries, expenses of plant-breeding, or expcrimental work, should certainly be paid by the college itself from the Hatch experiment station funds.

We have obligations on this society by law to do educational work and we should comply with the law. The money spent should be in line of statuary requirement in aiding auxilliary societies and organizing county societies. This is plainly our duty. All funds should be used to give out, after collecting facts from proper sources, information that is unbiased and valuable for every section of Iowa, even to the remotest townships in this state.

C. L. WATROUS: I do not want that paper to be passed without setting history straight. The first law organizing this society, is as stated. The second contention, that we ought not to do any fruit growing or experiment work, because the law does not say so, is wrongfully taken, and that I know. I know that in the winter of '83-84, we had a terrible killing in our orchards. I know R. P. Speer was president at that time. I know, at least, that he took the laboring oar on the part of the members of the society and I am almost certain that he was president, and this was done immediately after that. I know he wrote personal letters to a great many of the senators and representatives, and represented to them that the orchards of the state had been sadly injured, and in many instances ruined, and the people were discouraged, and they wanted the legislature to come to their assistance and help them with some money, to originate new varieties. It fell upon me to present the matter before committees in the house and senate. That was the argument and the only argument that was used. I know these were the grounds upon which those funds were based. I know it

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was upon these grounds, that after discussion, much discussion in the committee, it finally went through. I remember very well the instance of the toughness of the mule being referred to by some members, as a hybrid, and if you crossed fruits, the result would be as happy as in the case of the mule.

The appropriation was given solely upon the ground that it was to be used in the endeavor, in some manner, to create new vareties of fruit. That matter was before the legislature for two or three months and it was very extensively discussed. I say here, upon my own word and honor as a man, and challenge anybody to dispute it, that it was passed and asked for solely upon the ground that it was needed to be used in the endeavor to bring out new fruits, and not otherwise. We had no other excuse; no other excuse was offered, and I never heard of any other ground upon which that money was granted, except that it was to be used in the production of new fruits.

Now, when you construe a statute, you do not always find a reason why a certain law was passed. The organic act of this society was amended and changed the time of our meeting from January to some other time. The reason for it was, the report was put in the hands of the state printer at the time the legislature was in session, and we did not get it until the next summer. That was the reason why the change was made. I say these things in the way of history, to keep history straight.

THE PRESIDENT: We will listen to a paper entitled, "Some Observations During the Season of 1900."

SOME OBSERVATIONS DURING THE SEASON OF 1900.

BY C. L. WATROUS, DES MOINES.

There was on my place a great deal of fruit last summer and the behavior of different sorts and their relative value as money makers made an interesting study.

The plum crop impressed upon me, as nothing ever has before, the question whether this region of Iowa has done enough with the narrow-leafed plums—making no technical distinctions between Wild Goose, Chicasaw and other groups into which the botonists divide them. Judging by this year the Milton, if it be planted very closely with Hammer, or if it have the latter top-grafted with it in the same tree so as to afford pollination, is a very desirable plum for early market. The Wild Goose bore a good crop of very handsome fruit also. The Robinson, fully self fertile, handsome, good and fruittul, was very profitable. The Pottawattamie, of the same type,

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mid-season, is perhaps the most beautiful plum tree on the place when in fruit and gives abundance of handsome fruit which sells well. The Transparent, or Yellow Transparent, is also abundantly self fertile and a handsome fruit. The Charles Downing, rather late, needs fertilizing. Perhaps Hammer is as useful as any for that purpose and is, by itself, one of the most profitable market sorts so far tried on my place. The Miner, where mixed with other sorts, either top-grafted in the same tree or planted in close proximity, bore a very full crop which sold readily in the market after the main crop of the Americana plums had passed, so that the Miner brought good prices and there was no trouble to sell as many baskets as we could haul into the city. The Champion, a seedling of Mr. Terry, resembles Miner in tree and fruit very closely though the tree is rated as strictly an Americana. Another new plum fruiting this year first is called Beatty—Americana, rather large, mid-season, very handsome, of extremely good quality and abundantly self fertile. It seems very promising. The Hammer this year proved itself better than Hawkeye, Stoddard, Wyant, Forest Garden or several others apparently more nearly of pure Americana origin.

New Ulm and Snook, which on my place seem identical, rotted very badly as did several of the better known Americanas. During a wet season the Americanas seem more subject to rot than those of the narrow leafed type or of the medium type like Miner, etc.

Of new cherries, the sort called Northwest is certainly the earliest cherry so far fruited and seems desirable for those growing fruit for market. For family use it is pretty sour. Fruit of the Baldwin sent by the originator from Kansas was undistinguishable in any respect from fruit of the Northwest as grown here. This is not saying that the Baldwin is not a seedling or that the originator is not acting entirely in good faith in putting it out.

Of raspberries the Eureka gives good promise as an early berry. The bushes are large and upright and the fruit abundant and good. A sort not very much grown here called Lotta, which originated in Kansas, is a midseason berry which I should not like on any account to be without.

The year has done more than any other to thoroughly discourage me about planting any plums of the European or Domestica sort for profit. They seem strictly amateur fruits in this locality. Nearly fifty trees of at least a dozen sorts fruited on my grounds or tried to fruit, but not a single specimen of them all remained on the trees to maturity. Curculio and rot—chiefly rot—wrought the destruction. It is a sin to recommend any of the European sorts of plums to the uninformed who wish to plant for profit, in this vicinity.

The more plum trees are mixed with each other, either by close planting or, better, by top grafting several sorts in the same tree the better the results seem to be. I am more than ever convinced of the benefits of mixed planting of large and small fruits on the same ground where one wishes to grow both classes of fruit. My experience has been that one class helps the other in the way of protection, winter and summer.

In the line of shrubs the Golden Leaved Elder, the Cut-leaved or fern-leaved Sumach and the Siberian Dogwood seem to me to deserve to be much better known and more extensively planted. They have been very little used so far as I have observed, in this state and they seem to me three of the most striking and pleasing of all the shrubs I have known.

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If there were time I should like to tell this society about a wonderful day spent with Professor Craig on the grounds of Theo. Williams of Benson, Nebr., last August. The grounds are about six miles from the business part of Omaha and are not much visited by strangers because the owner seems inclined to not desire such visitors and he keeps dogs. He has done a wonderful work in hybridizing the various groups and species of plums and cherries. Literally thousands of crosses have been made. Pottawattamie crossed with Japs, chiefly Ogon, are there by the score. Wild Goose has been crossed with Japs, with the Domesticas, with Sand Cherry and with Americana and Nigra plums. The offspring is there in every degree of interesting hibridity. Wild Goose is crossed with Montmorency Cherry, also with English Morello also with Marianna plum and with the Sand Cherry. Japan plums are crossed with the largest Americanas. Plums with Apricots also.

By special favor Mr. Williams furnished me with buds of some of his promising crosses and they are now growing, both on stocks in the ground and in the tops of bearing trees.

The object of Mr. Williams is to produce a handsome plum of high color, good quality and of such texture of skin and flesh as to permit it to become a shipping or market plum. He insists that at present we have no market plum among the Americans and that we must work until we secure seedlings with the firm flesh and tough skin of the Domesticas. Then we shall have shipping plums.

A lesson of value to us all from the day spent at Mr. Williams' is that any fruit grower may do as much crossing as he pleases and with as good promise of success as if it were done by a most skilled scientist. He only need to insert a graft of the sort he wishes to use as one side of his cross in a bearing tree of the other side and when the two sorts are in bloom, make a big sack of mosquito netting and put over the different branches and fasten it tightly at the bottom. In this way he will secure hybrids of as undoubted purity as if the work had been done by hand and in a few minutes work he may secure scores of hybrid fruits.

Also Mr. Williams is strongly of opinion that better results are likely to follow from this method of crossing than where the scientific hand work is pursued. He says that the first and primary crossing must be done by hand but that the secondary ones, which are these I now speak of, may be done in the manner above indicated with perfect success and in his judgment it is the best. A letter from Luther Burbank of California confirms these views, wherefore it seems to me that this society ought to take fresh courage and a new resolve to do more and better work towards breeding varieties of fruit thoroughly adapted to the conditions of this prairie region.

At this juncture John Cownie, a member of the Board of Control of State Institutions, was introduced to the Society by the president.

Mr. Cownie spoke as follows: While we recognize the great work this Horticultural Society has done in Iowa, I came here this afternoon to impress upon you gentlemen the fact that you are away behind in the process of producing banannas where we are producing them.

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MR. LATHROP: Would you have us all go to the penitentiary to do that.

ANSWER: No; it shows though, if it shows anything, that we must have some expert horticulturists there that can do this. When we visited the penitentiary at Ft. Madison a few weeks ago, we visited the greenhouse, in charge of a gentleman—he happens to be down there now on a vacation, and has charge of the greenhouse. It is surprising, however, the number of tropical plants he is growing there. He has several bananna trees, and one of them had a large bunch of banannas at that time. He promised, as soon as they were ripe, he would send us a part of the bunch. Probably you are all aware that I have great faith in Iowa. I do not believe they can raise much outside of Iowa, and when I look at that bunch of banannas, raised upon Iowa soil, it really looks to me fully as long as that chandelier. I will take a few of them off here, so that you can taste them. I do not think they will kill you, for the reason that the office boy and I ate a part of them; he is still living this morning, and so am I. If you will divide them up, and taste them, you will then be able to say that you have eaten banannas raised in Iowa.

A MEEBER: What does it cost to raise them?

ANSWER: I think they can be raised cheaper than hogs.

THE PRESIDENT: The next paper is entitled, "The Benefit the San Jose Scale has been to Iowa," by Prof. A. E. Summers, of Ames.

THE BENEFIT OF THE SAN JOSE SCALE TO IOWA.

H. E. SUMMERS, STATE ENTOMOLOGIST, AMES.

The struggle for existence that is constantly going on among all organisms, combined with the elimination of the unfit, has resulted in the development, in past time, from low and feeble creatures, of all the manifold forms of living beings, of all grades of strength and intelligence, adapted to all kinds of environment, that now people the earth. Without this struggle, all animals would have remained jelly-fishes; back-boned animals would not have developed. And even to-day, without some struggles, a man is not apt to develop much backbone.

As the far higher plane on which most animals now live is due to the struggle for existence, so the present standards in horticultural methods and results are due to the obstacles that the fruit grower has encountered in the past. When these obstacles are not too great, he has commonly endured them without making any very active exertions to remove them entirely

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from his path; but when they have actually threatened the destruction of his occupation, or what amounts to the same thing, have made the cost of production so high as to eliminate profits, then he has been compelled to find means to overcome the adverse conditions. And now, a most important fact, the new methods learned enable him not only to overcome the particular enemy that led to their devising, but in nearly every case are susceptible of application in numerous ways at first unthought of, and lead ultimately to an improvement in his own and many related occupations.

The case of the Colorado potato beetle furnishes one of the best illustrations of this. Within the memory of most of the members of this society great anxiety was felt among potato growers in the east concerning a new pest that was reported devastating the fields in the west, and gradually spreading eastward. Reports were so bad that pessimists thought the growing of potatoes in America would have to be abandoned. We smile at this to-day, but twenty-five years ago there seemed considerable ground for the opinion. The beetle came, and whole fields were destroyed. As it appeared successively in new localities many large growers gave up the business, and others made no profits for several years. But many brains were actively at work on the problem, and finally the use of Paris green was discovered. Incidentally this gave a means for destroying the beetle so sure and easy that those who adopted it at once, before the normal acreage was again planted, made increased profits for several years; a method was at hand that made the destruction of the Colorado potato beetle a mere detail in potato culture. But of far more importance thousands of farmers' boys were shaken out of the notion that to follow in the same old ruts was the way to become good farmers; for all the rest of their lives they would be the more ready to examine and judge of the merits of new methods. A few of them even had aroused an interest in insects that ultimately made of them professional entomologists. Further, there was introduced into agricultural practice the use of *the arsenites;* a means of destroying insects that revolutionized economic entomology, and has led to the development of practical methods for combatting several score of our most injurious fruit insects. In some one of their many modifications these methods can be applied to a majority of insects with *biting* mouths.

The case of the San Jose scale is more recent. In many states the struggle with it is just begun. As with the potato beetle, some pessimists, to my mind very foolishly, fear that the fruit industry will be exterminated. Few there are in states east of us who are yet in a state of mind to consider *benefits* from this insect. I presume that were I to offer such a suggestion to the Mayland State Horticultural Society, if I were not promptly mobbed it would be due only to the self control and eagerness for new ideas for which horticulturalists the world over are noted. Yet to us who are, most fortunately from some points of view, removed from the struggle, some benefits, at least to ourselves, are already discoverable.

The imminence of the danger from this insect to the horticultural interests of the eastern states aroused a great and sudden interest in the entire subject of economic entomology, and led to generous appropriations in nearly every state with extensive horticultural interests. These have enabled investigations to be carried on that have made possible great advances in methods of combatting injurious species, especially in systematic spraying

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operations. Iowa can profit by these improved methods, although the state is not bearing any share of the expense of carrying on the investigations. For the two years preceding July 1, 1900, there were used in Iowa of state funds, only $558.43 for entomological work; and this entirely for nursery inspection. This is in striking contrast to Illinois, with over $9,000 for the same period for San Jose scale work alone, and another large appropriation, the exact amount of which I cannot state, for general entomological work; of Maryland, with $8,000 per year; of Ohio, with a similar amount; and of still larger amounts in other states, the exact figures of which are not at hand.

It seems as if these investigations would finally result in as great an improvement in the methods of combatting insects with sucking mouths as resulted from the discovery of Paris green in the case of those with biting mouths.

Another benefit arises from the continually greater care that is being exercised in the nursery inspection in other states. Insects that a few years ago were disregarded, even where any inspection at all was required, must now be destroyed in the nursery before a certificate will be issued. The result is that those Iowa planters who receive trees grown outside of the state are probably getting cleaner stock to-day than ever before.

The cleanness of the stock grown in our own state has been similarly influenced. As one example may be mentioned the case of the scurfy scale. While this is on the whole one of the less injurious of the scales, it is nevertheless responsible for the lack of vitality and even for the death of the trees in many old orchards. When the nursery inspection work began in 1898, there were severai nurseries badly infested by this insect, and which were spreading it broadcast among their customers. I believe that I am right in saying that to-day it has been entirely exterminated from a majority of these nurseries, and that the nursery stock in the others is either entirely or so nearly free from it that not one per cent as many are being sent out as formerly on Iowa grown stock. I am sorry to say that it is still being shipped to us in large numbers from other states; our present law, however, does not give me the power to take any official action in this matter.

Finally, the arousing of a general interest in insects in many persons that had not before thought much about them is of no small importance. One evidence of this is the constantly increasing number of letters received at the Entomologist's office, many of which can be answered far too incompletely without investigations for which at present the state makes no provision.

To sum up, then, the people of Iowa have been benefited by the San Jose scale in the following ways:

(1.) Increased knowledge of many economic insects.

(2.) Cleaner nursery stock shipped into state.

(3.) Cleaner nurseries in the state.

(4.) Arousing of general interest in insects, and a desire for information concerning them.

THE PRESIDENT: The next paper is entitled, "Notes and Observations on the Climatology of Iowa, by J. R. Sage, Director of the Iowa Weather and Crop Service, of Des Moines.

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NOTES ON THE CLIMATOLOGY OF IOWA.

BY J. R. SAGE, DES MOINES.

Climate is a product of certain elements and properties of the atmosphere, and physical features and conditions of the earth's surface. And as these elements and conditions are substantially permanent, we have ample assurance of the stability of climate. The sun's energy is a physical constant, producing in earth and air the threefold forms of force termed heat, light and electricity, and causing the varied phenomena of evaporation and precipitation, wind movements, storms, etc. So we have nature's warranty that the climate of this section will be practically unchanged so long as the continents and seas abide in their present forms and bounds, and the everlasting mountains remain in place.

All climatic records attest this fact of permanence. And the study of climatology may find in the constituents of the soil ample proofs as to the weather conditions existing many thousands of years prior to the historic age, in like manner as the skilled geologist reads in the rocks the graphic story of nature's processes in world-building in the more distant epochs of the past.

One of the most obvious facts as to the climate of this midland region is the wide range of extremes, and the marked variableness of the seasons as compared with the normals This does not in the least contravene the theory of the permanence of climate; but it simply implies that one of the permanent features of daily and seasonal weather is this tendency toward variation. Every season illustrates the fact that the law of variety holds sway in relation to the weather as in all of nature's operations. The past season was notable as a record-breaker in respect to sustained high temperature for many days during the summer; and 1899 broke all records of long continued low temperature in the winter. So with substantial unity and stability, we note perpetual variety and changefulness. In respect to the weather, irregularity is the regular thing to be expected. And if a year should be strictly normal from first to last, it would take rank as a phenomenal exception among all the years of record. Thus we reach the apparently paradoxical conclusion that in weather the exceptional condition is the rule, and some measure of departure from the normal is the normal state of things.

In weather records the averages are carefully noted, but the extremes most vitally affect human interests. And the tendency toward extremes is the most striking feature of the climate of this mid-continent region. Being remote from the equalizing effects of the oceans, it has winters of considerable severity and summers of unusual warmth. In Iowa the records of temperature for the past decade show an average range of 136 degrees per year.

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The highest temperature recorded for the ten year period was 110 degrees in July, 1890, and the lowest was forty degrees below zero in February, 1899, making a range of 150 degrees for the decade. These figures may be regarded as about the maximum and minimum of temperature for this state. And now as illustrating the difference between an insular and a continental climate, it may be stated that in the Bermudas the annual range is only thirty-six degrees, the maximum being eighty-five and the minimum forty-nine degrees.

Variableness in the annual and seasonable precipitation is also a notable feature of our climate; and for that matter there is no part of this continent wholly exempt from severe drouths or damaging excess of moisture. Since 1890 we have had about the full extent of variation that may be expected in this section. The average precipitation for the state is a little over thirty inches per year; and in the last decade the lowest amount was 21.95 inches in 1894, and the highest 37.45 inches in 1896. The normal for the three summer months is 11 inches. In 1894 the total for the summer months was only 4.88 inches; and in 1900 the amount was 14.78, or 10 inches above the low water mark. That difference of about 10 inches in the critical months of the crop season accounts for the fact that the output of cereals in 1900 was more than twice the total produced in 1894.

There is marked inequality in the distribution of rainfall in a single season, within the limits of this state, and sometimes within the narrow bounds of a few counties. A considerable portion of the summer rainfall comes in form of purely local showers that irrigate narrow belts and short distances. So it happens at times that a portion of a single county may suffer from drouth while the adjoining parts are well watered. Our precipitation maps. issued monthly, graphically illustrates this feature of the climate.

Fully 70 per cent. on the average, of our annual precipitation falls in the six crop months, and over 37 per cent of the yearly total comes in the three summer months. So there is in Iowa a wet and dry season about as well defined as in some of the tropical countries. This must be taken into account as an important factor in fruit growing and farming. During the past eleven years the average from April 1st to October 1st has been 21.67 inches, with some noteworthy departures above and below. In 1892 the state average for the crop season was 27.77 inches; in 1896, it was 29.33 inches, and in 1900, 25.74 inches. But in 1894, the memorable year of the great drouth, the amount was only 13.39 inches, and about half of that total fell in April and September, leaving the four months, in which the bulk of crop growth was made, with very scant moisture. It seems almost miraculous that the cereal products of that extremely dry season amounted to over 256 million bushels, and fruit was far above a total failure. That drouthy period, which began in 1893 and did not wholly terminate until the summer of 1895, gave us a crucial test of the hardiness of trees, shrubs and plants, and attested the drouth-resisting qualities of Iowa soil. Whatever survived was certainly well fitted for the survival.

The records show that quite severe drouthy periods have occurred at irregular intervals, averaging about one to two in each decade, since the early settlement of this region. But the drouths of former days were not so destructive to crops because there was not so much to suffer injury, and the stores of ground water were not so heavily drawn upon to sustain plant growth.

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Probably the best all-round crop year of the decade was 1895; that is, it was best both for the production and harvesting of crops. And yet the soil was extremely dry at seed time, and there was less than the usual amount of rainfall throughout the season. The soil and subsoil in March and April contained less moisture than had ever been known at that period since the early settlement of the country. The great drouth of 1894 had given the soil a period of rest and recuperation; the surface ponds and miasmatic sloughs had been thoroughly drained and dried out, and thousands of acres of the richest lands in the state were made arable and bore great crops. The moderate rains of that season were fairly well distributed and came often enough to maintain crop growth. No water was wasted by being held in ponds and sloughs to be evaporated by sun and winds; but it was mostly utilized by evaporation through plants, which is the scientific way of using up rainfall. And this leads to the statement that in this climate, and with our receptive and retentive soil, the best results are brought fourth in seasons when there is a tendency toward shortage rather than excess of rainfall. It is better not to have the basins, pools, sloughs and streams continually full of water; better in fact, to have the moisture all absorbed and held below the surface. In all the years of crop production in Iowa it is probable that more actual loss has resulted from excess than deficiency of rainfall in the growing season.

The farmers and fruit growers of this region are most seriously affected by windstorms, in form of hot winds of drouthy periods, and the squalls and more swiftly destructive storms of the summer. But these are necessary ills; for it should be noted that this great valley, being so remote from the gulf and oceans, must needs be watered by the expenditure of stupendous force. Every drop of water that comes into this inland region is imported, and brought hither at heavy cost of transportation. Those who receive the benefits must pay the freight in one form or another. THE SUN, WIND & CO., have formed a gigantic combination, and hold a monopoly of the irrigation business. The GULF is in the pool, and the combine is strictly "unlimited." CYCLONES are the vehicles of transportation, and when they are sweeping across the continent they hold the right of way. There seems to be no other way to get our fields watered, so we must pay the cost in form of damage, though we are assured that the benefits vastly exceed the incidental injuries. But whether we like the system or not, we must submit to nature's methods, or the ways of Providence. Most likely we should make a botch of the business if we should try to amend the constitution of the universe!

Now there are regions where the climate is more agreeable to invalids and indolent people, and where delicate fruits and nuts may be produced, at small cost of care and labor; but no portion of the earth's surface is better adapted to the development of hardy, stalwart and brainy people than this fertile valley, where the rigors and extremes of climate incite men to a strenuous life. Some of the adverse conditions seem to be necessary to develop hardiness and vigor in plants, animals and mankind.

There is no perfect climate on earth. The climate of Iowa, despite the ills I have enumerated, seems to be most admirably adapted to produce great field crops and fairly good fruits of the temperate zone. There must needs be some very benign elements, else such vast quantities could not be produced with the slack and unscientific methods so largely prevalent here.

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We may go abroad and find some favored localities where the climate is more equable, and where hot winds, squalls, blizzards and tornadoes are unknown; but when we remove to such a paradise, we had better provide sufficient cash to send back to Iowa for the substantial necessities of life. Man cannot live on climate alone, however dry, delightful and salubrious.

But the most of us must stay here where the great staples of food are produced. We must accept the situation and make the most of it, knowing full well that we cannot change the general features of the climate. The records of the past, showing great variability and wide range of extremes, gives us prophetic warnings as to future conditions. The first half of the twentieth century will bring extremes of temperature, severe windstorms, and alternations of wet and dry seasons, in about the same measure as the last half of the nineteenth century. There will be about the same old wild symphony of nature and the elements—with the variations.

This is the condition as well as theory confronting us;—and what shall we do about it? Just this,—study the art of adaptation to existing conditions. Take the weather as it comes, without croaking against Providence (or the weather service) and use all the resources of human ingenuity and art to improve the environments. That's what we are here for, and that's why men are endowed with brains as well as hands.

We construct houses for the comfort and safety of our families, and the thrifty farmer provides ample shelter for his domestic herds. Some measure of this thoughtful care and shelter should be given to fruits and vegetables, and even some of the field crops. I cannot go extensively into details, for it would require a volume to set forth all that may be said hereon. In all our year-books of horticulture there are many helpful hints and suggestions to this end, but there is need of line upon line to enforce the precepts and incite men to the practice of affording protection to orchards, small fruits and vegetables against the extremes of heat and cold, wet and dry weather, incident to this region.

It appears to me that there is a lack of sense and science in planting a farm orchard, with the usual varieties of tender and hardy fruits, on an elevated site, exposed to all the winds that blow. That certainly is not nature's method in planting and caring for even the most wild and hardy of the native varieties. In their native state apple trees were found in the friendly environment of groves, or cuddling together on the leeward side of slopes to escape the severity of damaging winds. The apple is easily at the head of the list of fruits of the temperate zone, and the apple orchard should be given the best location the farm affords, and the best care that may be afforded.

The way to protect a tree is to plant a great many other trees. Only an extremely hardy tree of any species can withstand the full force of our prairie winds. The most favorable location for an apple orchard is a well drained and fertile field sloping to the northeast, and it would be well to give additional protection by shelter belts at the south and west. If such slope cannot be had, then the need is more imperative to provide ample shelter belts at the south and west. The heaviest loss suffered in apple orchards in Iowa is from the effects of hot southwest winds, and the severe wind squalls that sweep down from the west and northwest. A very large percentage of apples grown this year were blown from the trees before maturity.

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The problem to be solved is how to secure air drainage and sufficient sunshine, and at the same time protect the orchards from destructive hot winds and severe squalls. By deep planting, proper drainage, and nature's system of mulching, there need be but little loss from root killing during our severest winters. The value of tile drainage to warm the soil early in spring, to keep it in good tilth and make it retentive of moisture in drouthy seasons, has never been duly appreciated. I believe that by thorough drainage and proper culture of orchards and fields it is possible to grow excellent crops in the most drouthy season ever known in this section. And certainly no one will question the value of tiling in extremely wet seasons.

One of the most difficult problems is how to protect fruits and field crops in seasons when hot winds prevail for many days, and possibly weeks. But by study of the situation you will observe that the extent of damage depends upon the location and exposure to the full effects of the scorching blasts from the southwest. A stubble-field, or a closely cropped and dried up pasture, situated at the windward side of a cornfield or orchard, will add very greatly to the deadly effects of winds that blow thirty miles an hour when the temperature is among the upper nineties, and the relative humidity of the air is very low. The fact should be noted that hot winds are local productions; that is to say, the scorching and deadly effects are due mainly to the number and extent of radiators that maintain the high temperatures. Stubble-fields, bare pastures, stretches of bare or sandy lands, etc., are the radiators that do the damage.

We are not afflicted by hot winds of the deadly type when the meadows, pastures and grainfields are covered by green and luxurient crops of grass and grain.

We are as yet in the experimental stages of our horticulture and agriculture in this section. In due time we will have produced varieties of fruits, grains and vegetables that are thoroughly acclimated, and hardy enough to withstand all the extremes of climate. We cannot change the climate or increase or decrease the rainfall, but we may hedge against adverse conditions, and achieve fair success in even the worst seasons ever known.

I am satisfied that in the line of judicious and scientific forestry the best work of the future is to be done. The treeless farm will be a rare thing in Iowa before the middle of the coming century. With fully one-fourth or one-third of our entire area in timber belts, groves and orchards, the balance of the land will produce larger crops in all seasons, and the conditions will be more comfortable for the happy and prosperous people who abide in this most productive state.

THURSDAY EVENING SESSION, 7:30 P. M.

THE PRESIDENT: The first paper this evening is entitled, "The Lawn," by A. F. Collman, of Corning.

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THE LAWN.

BY A. F. COLLMAN, CORNING.

Mr. President:

There is no subject that brings us nearer home than the lawn, for it is there where we, when children, drank at the fountain of horticulture. It may be only the fragrance of a beautiful rose that turned our thought to the beauty in nature—or the old time, or beautiful pinks that graced the walk to the dear old home, or the clump of shade trees where we used to swing in twilight while listening to the warble of the whippoor-will, in the grove near by, or the beautiful carpet of green that is always cheerful and lovely to look upon.

The more attention we give our home grounds, the more attractive and dearer our home grows. The observing mind can't help but notice the home-surroundings while passing through the country, for they are known and read by men. We read character by the general outlines of our fellow-men. And we are judged to a certain extent by our home surroundings. The beginner, sometimes struggling against adversity—in want of the luxuries, and even necessities of life, have a delightful home. You can see the sunlight of Heaven in all the surroundings. One person may be adorned in costly apparel and be poorly dressed, while another may be clothed in common clothing without jewels and be *well dressed.* So the wealthy may spend considerable money for trees, shrubs and grasses and his home surroundings be without form and comliness. It is not necessary that we go to great expense to fit up our home surroundings. To make them attractive certain rules should always be observed in the decorations of any kind. *The home must* be the center of attraction. The view of the highway or street must not be obstructed by trees or shrubs, or anything that will detract the view of the passer-by. And all pains should be taken to make a pleasing back-ground. The out-houses should be hid with vines and clumps of trees or evergreens. The barn should not be hid from view, but should be back, right or left from residence for convenience, but all small buildings should be hid from view.

I would grade the yard, so the ground would slope gently in all directions from the house. Then plow the ground deep—or better still, subsoil, and be sure to make the suface *fine*, *level*, and *smooth*. Then sow thickly with blue grass, and sow in oats at the rate of about one bushel per acre, for a nurse crop—then rake or harrow after sowing. I would lay out the walk with a gentle curve or straight to suit the surroundings, and make the walk about three feet wide and pave with brick, then plant grass pinks for a border. I would plant a few shrubs to the right and left and plant European Larch, hard or sugar maple for a back-ground and plant with a view to allow a free circulation of air, and the beautiful sunlight of Heaven around

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the home. When the oats are sowed the ground should be left in good condition, then rolled so the surface will be smooth and firm to retain moisture. When the oats attain the height of three inches, it should be dressed with a lawn mower and kept moist and cut once a week at least until after the oats begin to decline; then the blue grass will cover the ground, before cold weather give the lawn a good dressing with well rotted manure to feed and protect the young plants. And your lawn will be permanent and beautiful, and be a monument to your memory after you are gone.

PROFESSOR ERWIN: What is the object of this nursing crop you mention?

ANSWER: When you sow blue grass, it takes some time to sprout, and the oats come up very readily and will have a tendency to keep the ground moist.

A MEMBER: My experience with a nurse crop is variable, as everybody else's. I would not use oats for a nurse crop. Oats is quite a plant to take up moisture, and an excessive amount of moisture; of course the more moisture you have in the ground the better. I would use mown blue grass off the blue grass pasture; just let the hay lay on there and use that hay as a mulch on the ground.

MR. COLLMAN: While I was at the Omaha Exposition I learned a good deal about making lawns there. They sowed oats there and would sprinkle it and when the oats began to decline, the blue grass made quite a little sod.

A MEMBER: There is a point in planting lawns that is generally overlooked, that I think would be a valuable suggestion. It is this: You know it is generally recommended that you plant shrubs in groups. If you plant, say two or three hydrangeas, or two or three snow-balls, they look nicer in groups than to have a singe plant alone. There is a great deal more to that kind of planting than beauty. If you plant a group of anything, the shade of the one will help the other shrub by its proximity. Say you have a group of white pine on the back of your lawn and have a few shrubs just near those trees, the shrubs do better on account of their nearness to the trees and to each other. There is a good deal more than beauty in the arrangement of shrubs.

THE PRESIDENT: The next paper is entitled, "The Rose Garden," by J. A. Callison, of Des Moines.

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THE ROSE GARDEN.

BY J. A. CALLISON, DES MOINES.

The rose is the most famous flower in the world, I shall not say it is the queen of flowers, because the remark might be thought, to lack originality. It is a universal favorite. It is the flower alike of prince and peasant. It is admired and loved equally by fine ladies and their waiting maids.

To paraphrase a saying of Thackery, all people love roses—historians, lawyers and mathamaticians. A vast number of clever hard headed men, as well as sweet young girls and their kind tender mothers. The rose has a rich literature, so extensive that to be learned in its lore would take the study of a life time.

The varieties of the rose run into the thousonds. No one can hope to see half of them, to let alone the thought of growing them. Men who write papers on roses usually name a score or so of varieties, and give their reasons for choosing them. But what's the use? They are all described in the catalogues and in the tomes of the State Association. There is another reason why I do not name them. I have a strong reluctance to mentioning long French proper names in a public assembly. Let charity suggest the reason. Let me say in passing that the uncouth foreign names, given to roses as well as to other flowers, are a great hindrance to the comfort of flowers and lovers. Let us amend the poverb, which says, "There is no rose without its thorn" and make it read there is no rose without its mouth-twisting foreign name. How absurd to name roses for dukes and barons and grizzled old generals! For the sake of example, one of the most beatiful roses there is, is called Baron Bonstetten. It is a rich soft, dark red rose, and if it suggests anything, it suggests beauty, softness, tenderness and grace. Why name such a flower for some truculent, debauched, wizened old nobleman? Peace to the baron, whoever he was and where ever he lived, the writer wots not. He may have been a courtly old knight, or he may be a present day diplomat. Certainly the rose which bears his name, is the finest flower of its class.

In a paper on the rose garden, one would expect directions for planting and an exposition of the best cultural methods. Again we must refer you to the catalogues and the books. It would be tedious also to enumerate the the bugs and slugs, and the drugs which overcome them. On none of these topics could this paper hope to be instructive to an audience like this. I must look further for a title to write.

One day last spring the writer saw a very dignified, well dressed lady planting a rose bush. She had a fire shovel and had reamed out a little hole in the lawn; piteously shallow, and pathetically narrow, then she deftly wound up the roots in a ball, and thrust them into the ground. Then after shoveling a pocket handkerchief full of dirt around it, she turned away and

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the Gen. Jacqueminot was consigned to the elements. With what bright hopes or with what dark fears, she went away, we shall never know.

There is something humorous about planting a rose bush in the bosom of a blue grass sod. It is also pathetic. There is a ludicrous disparity between the end sought and the means employed. The result desired is a thrifty rose bush and the means by which the consumation was sought would insult a sunflower. My lady friend would have known better than to try to grow corn or potatoes in this fashion, but this was a rose. Moreover, the bush was expected not only to live and bear flowers, but it was expected to continue to bloom all summer long, for it was warranted to be an ever blooming rose. It was also to be a perpetual bloomer. The agent had said so. Why then might it not be expected to do its duty and to live up to its lineage and justify the impassioned promises of the salesman. This sort of horticulture is gibe provoking, and proper food for mirth, but it has a serious side. The inevitable failure that follows diminishes the planters zeal, and after a few such abortive plantings, he forswears roses and turns away in disgust. Now it is the law of nature, that we can't have something for nothing and the finest, and the best things require the most effort. To succeed with roses we must be willing to pay the price. There is no use in talking of growing fine roses on the lawn. Unless you are willing to remove a square yard of turf, lets take the bush to the garden, the soil there should be thoroughly worked up to a depth of two feet. It must be made as rich as fertilizers can make it, for the rose is a gross feeder. It must be constantly stirred and raked. The foliage of the bushes must be cleaned thoroughly at least once a week by spraying. Oftener than that would be better. The old shoots must be kept cut away to encourage the growth of new ones, and all summer long, you must wage an unceasing war on the bugs. Now, you say this is too much trouble, but it isn't too much trouble, at any rate it takes just that much trouble to get fine roses and plenty of them. Of course, we are not talking now of Prairie Queens and Harrison's Yellow, but of Tea and H. P. roses.

Now the point we want to emphasize is that rose growers don't take themselves seriously enough. We want to succeed with roses. All right then. We must get up at day break and fork up the earth around them; in the evening we must spray them; in dry weather we must water them; in winter we must cover them; always we must watch for bugs and scale and fungus and rose diseases innumerable. Forget the bushes for two week in July and the season of roses for us is ended. Now, are they worth it? Most certainly they are. Lets resolve to plant at least half the garden in roses next year. We can buy our cabbages.

Now, we Americans, as a people, do not give nearly enough attention to flowers, particularly we Western Americans. Every farmer with his broad acres should have a rose garden, and every city or town resident should have one whether he owns his place or rents it. If the latter has no garden, he should have a collection of roses in pots. We as a society should talk more about roses and less about Duchess seedlings and late keeping apples. The writer would like to join a rose society here in Des Moines, which should have monthly meetings at which all other topics should be forbidden. We rose growers are too stingy in our outlay of time and labor and money. If we have roses at all, we should not be content with a few.

Ten varieties should not satisfy us. We should have at least fifty and a rich man should have several hundred.

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One old gentleman recently said to the writer, that he didn't understand the fuss that was made over roses. He thought artificial roses were just as pretty and much more durable. He showed me some made from tissue paper. Now, herein is a mystery. There are lots of old gentlemen like this one and old ladies, too, I fear. All their lives they have seen the beauty of creation—the sun-sets golden glory, the glint of the morning light on the hill tops, they have heard the thrush's song and inhaled the dewy aroma from the meadow, and their impressions of these things are purely physical and sensual. The glories of nature have no spiritual meaning to them and teach no spiritual things.

Now, this man's remark revealed his shallowness, his dullness, his lack of insight into nature.

There is a symbolism in flowers, quite different of course from what is understood as the "Language of Flowers" by lackadisical youth and which is interpreted by the patent medicine almanac. Thus the pansy with its strangely human-like face suggests sympathy, hearts-ease, as plainly as speaking. The Madonna lily shames course thoughts and base passions and makes one wish he were purer and better. A bed of poppies is a wholesome sight, for a man with an exaggerated feeling of responsibility. It should lighten his heart to see them. How utterly frivolous they look in their gay colors. They die with the day, but how joyously they flaunt themselves, drinking in the sunshine, fairly reveling in the light and heat of the mid-summer day. The rose is something more than its petals, its glory and its perfume. The rose grower knows secrets he cannot tell, and belongs to an esoteric school, and acquires a loving insight into the graces of nature. The beauteous, fragrant rose to him has a soul. It is a pledge of divine benevolence, a harbinger from a more beautiful world.

In Mr. Wilkie Collins novel the "Moonstone" the central character is a world renouned detective. This man always sought refuge from his contract with criminals in his rose garden. His life was spent amid the vilest surroundings, and it was among his roses, he washed his soul and cleansed his spirit. It was a fine thought of the novelist. To the world weary, passion ridden man or woman we would say grow roses, fence off a little plot, dig, plant, prune, cultivate. Draw close up to nature, she will speak to you a glad and consoling language. The day's work has been hard and its trials bitter, but in the evening as you walk among your roses, so redolent with beauty, then disappointments of the day are forgotten, the shafts of malice and envy fall from the heart, the tumult of passion dies, grief grows softer, the burdens of life become lighter, and there steals insensibly into the heart that peace, which is not of the world, but which is above and beyond it.

A MEMBER: Is there any hardier rose than the white rose?

MR. CALLISON: Why, I think that is not only a hardy rose, but it is a good rose in every way; it is a summer rose and will bloom profusely once, no matter how poor treatment you give it; it will kill back nearly to the ground every winter.

THE PRESIDENT: Col. Burnap, are you ready to make your report for the committee on resolutions?

COL. BURNAP: Yes sir.

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REPORT OF COMMITTEE ON RESOLUTIONS.

Your committee respectfully reports the following:

Resolved, That in the interest of pure food legislation, our chemists at the Agricultural College, at Ames, be requested to analyze such food products, liable to adulteration, as may be found in the open market, and report the result of their investigations to the legislative committee of this society.

Resolved, That the death of our honored members, Matt Parrott, L. Tatum, and J. H. Gear, leave a vacancy in our ranks not easily filled, and that with their immediate families and the state at large we deeply deplore and mournfully submit to our common loss.

Resolved, That we extend to Capt. R. P. Speer our sympathy in his physical sufferings, and earnestly hope for such early and effectual bodily improvement as will soon permit him to be an active co-laborer with us once more.

Resolved, That this society is the only body of men having the interests of horticulture in Iowa exclusively at heart; and as in much of its effective work it is necessary to labor in conjunction with the Horticultural Department of the Agricultural College at Ames: Therefore, justice to this society, to the state of Iowa, and the school at Ames itself, demands that in selecting a professor for the horticultural chair therein, the wishes and opinions of this society, as expressed by its officers and influential members should be respected and so far as possible complied with.

Resolved, That the thanks of this society be extended to our retiring officers, C. F. Gardner and W. M. Bomberger, and to our efficient secretary, Wesley Greene, for the faithful and efficient manner in which they have conducted our affairs and accomplished our success.

We further express our appreciation of the Press of Iowa for its courtesies, the Kirkwood hotel for its reduced rates, the State house officers and employees for the accommodations received, and of the kindness of all others who have helped to perfect the pleasant and profitable meeting now just closing. Respectfully submitted,

W. A. BURNAP.
C. G. PATTEN.
A. F. COLLMAN.

Upon motion the resolutions as read were adopted.

THE PRESIDENT: We will now take up the reports from the experiment stations. I will call on C. G. Patten, of Charles City.

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REPORT OF THE EXPERIMENT STATION AT CHARLES CITY.

BY C. G. PATTEN.

In reporting for my station I presume that it will be of interest to a majority of our members if I include some of the seedlings from selected seeds of my own as well as the cross-fertilized ones. A few of these trees were produced as far back as 1874, and some in '81, '83 and down to about nine years ago when the society began its experimental cross-fertilizing work with the larger fruits. But few trees of the latter have come into bearing, but enough to indicate the probable value of the work. And enough of those produced by selection to warrant me in giving to the society a fuller report of the work done here so that all may be able to see the results of wise selection in plant breeding. Mainly the seeds that have been planted on my grounds have been from known parentage on one side, and from known surroundings so that in many cases the parentage on the other side could be known with a good degree of certainty. These seedlings have been staked and labeled so that the element of chance and uncertainty has been as much eliminated as possible.

So far nearly every variety that I have fruited and sent out has proven larger and better than on my grounds, indicating that my location does not exagerate the value of the apples produced.

Duchess No. 6, a seedling of Duchess, 1874. It is an undoubted cross with the old Fall Pippin, that variety mingled its branches with the Duchess from which seeds were saved. Tree very fine, no blight; heavy, alternate bearer; color and texture of flesh the same as Fall Pippin, very melting and tender, juicy, mild acid; about medium in size.

Fameuse No. 1, or Patten's Fameuse, is a hardy tree, strong, spreading grower, bears young and steadily, white flesh like parent, full medium to large, striped, good for dessert or cooking, follows Duchess closely, would take the place of Maiden Blush or other apple of like season and quality, that cannot be grown here.

A sweet apple, seed of Ben Davis, an undoubted cross with Tolman Sweet, is of good size, faintly striped and blushed, very tender flesh; steady bearer; strong, spreading grower. Is the best fall and early winter sweet apple where hardness is required, that I know of, ought to have been sent out ten years ago.

Perry Russet seedling No. 3, resembling somewhat the Northern Spy in color, form and spicy flavor, keeping till February, is an apple that is worthy of being planted. It received first premium at your last State Fair, the past season; have waited to see when root-grafted if hardy, shall plant them in my orchard in spring.

The Brilliant is among those next in order of planting, receiving first premium in '96 at State Fair. In color, form, uniform size, and hanging

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to the tree it is nearly perfect; flavor is good to excellent. I have good hope of the value of this apple; sent scions two years ago to Novia Scotia to learn how it will do there.

Duchess No. 4, raised from seed of '76, is a good early fall eating or cooking apple, and an improvement in hardiness and non-blighting, over many of the older sorts. Duchess seed of '81, with Grimes Golden cross is very interesting, so nearly a reproduction of the latter, that apples of the third year in bearing, were thought by Colonel Brackett to be Grimes Golden. No trace of the Duchess is left in either tree or fruit, except in hardiness. It is an interesting sort for the farther evolution of new fruits.

About eleven years since our co-worker, Silas Wilson, sent me some Ben Davis and Winesap apples from which I saved seed, but unfortunately lost a good many of the little seedling. One seedling of Ben Davis took second premium at our State Fair this year. It is a size smaller than its parent; color red; keeps fairly well; and fifteen per cent better in quality, being a good eating apple; a moderate growing and strictly hardy looking tree.

One seedling of Winesap bears a good eating fall apple. Tree decidedly more hardy than the parent. Two seedlings of the White Winter Pearmain, one apparently a long keeping winter, one fall. Extra fine trees, the former as hardy in appearance as a crab, the latter perfection in form and growth.

I have not mentioned all of the selected seedlings that I believe worthy of notice, but space forbids farther mention at this time.

The cross pollenized seedlings are just beginning to bear, and they already show interesting results. Among them a cross of Duchess and Roman Stem, Pink Anis and Roman Stem. Also the Patten Greening and Roman Stem, bearing an apple that I think will be even larger than the Greening. Pink Anis and Jonathan gave a very nice, sweet, fair-sized apple.

One tree that seems to be of considerable promise is a cross of Grimes Golden on the Patten's Greening. The Greening appears to maintain its general characteristics in appearance and hardness of tree, and color of fruit, stamping it as one of the very best trees to breed from for our northern latitude. Mr. Stevens of Manitoba reported it at the late Minnesota state meeting as the most promising grower of all on his grounds.

Among the newer cross fertilized ones, nothing has attracted more attention than the crosses af the Pound Sweet and Briar Sweet. Four seedlings of this class have fruited this year, and all of them are sweet apples. This so far as I know is the most interesting experiment ever made in the scientific evolution of the apples in this country, and as these apples have something of a pedigree, they should be worthy of our special attention. Only one tree of the four is at all like the Briar Sweet in form, the others have spreading and somewhat irregular tops. All are stamped quite markedly with the size color, and texture of leaves and color of bark of the Briar Sweet. Three of them have the color and bloom of the Briar Sweet, while the larger one is in its first fruiting very similar in color to the Pound Sweet, a pure sweet, more tender in flesh and with the appearance of becoming a good sized apple. The smallest is nearly two sizes larger than the Briar Sweet. Another is promising in size and color, and all are of real good quality, and all are fall apples, the largest one being the latest.

All in the earlier stages of the fruit had the color of skin and dotings of the Pound Sweet. There are still four more of these seedlings to fruit.

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Their origin is as follows, Briar Sweet was produced about three miles north of Baraboo, Wisconsin, by a Mr. Briar, from seed of the old large red crab, about half or two-thirds as large as the Transcendent crab. The limbs of the Bailey Sweet interlocked with those of the crab, hence the large size, shading of fruit, and fine sweet flesh of the Briar Sweet.

Knowing the pedigree so far helped us to the belief that sweet apples might result from this cross, which may fairly be said to be quite a triumph in breeding the apple. It helps to light up the way to further improvements. We await with a good deal of interest to see the fruit of some crosses also of Wolf River and Briar Sweet.

The sweetest of all the apples that I have seen is that of a Wealthy seedling. Small size on first fruiting and very beautiful. It is not at all certain that the first fruit of a seedling will represent its natural size when the tree has born two or three years, it may increase from one to three times the size, and, perhaps not at all. The above will give the reader a fair glimpse of the work at this station, but it is only a glimpse. Our efforts in the artificial crossing of the plums has been almost a failure, twice we have succeeded very fairly. Once when Mr. N. K. Fluke did a large part of the the work we succeeded in securing a hundred sacks nicely filled with them, but all were destroyed with a hard freeze. Late freezes seem to be our worst drawback with the plum. However, we have continued to plant from our best surroundings, and Prof. John Craig when here last sumer was so favorably impressed with what he saw that he wrote for the *State Register* that I was "fruiting this year at least a dozen varieties which appear to equal anything in the named list of this season that we have at the present time." And I will add that for quality I believe that I have one that is superior to any native plum that I have seen, and I have seen large numbers of new plums in Iowa and Minnesota this year. However, another year's experience may place it below some other sorts, for I realize that rapid advances are being made with our native plum, and that one who keeps near the head of the procession will have to be alert, and do some tall thinking and acting.

For fourteen years I have been laying the foundation for the development of pears that will stand and be adapted to the climate of northern Iowa. Have a few trees that are just ready to bear, and if life and health are spared to another spring, it is my purpose to build upon the foundation already laid so surely and largely, that good pears and several of them will be the result.

I am most confident that out of two non-blighting, very hardy trees, one of Russian, and the other of Chinese origin, that we can by mingling the blood of good American pears, produce, Providence smiling on the efforts, something that we greatly desire. Already there are varieties top-worked into one of them, that are beginning to bear, the others must be worked with pollen obtained some distance south. The opportunities for improvement here, I feel sure are very great, and I would fain do even more than has been done.

In making a report of the work done at this station I will briefly add that it is, on the whole, in a very flourishing condition. Not a tree in the experimental work has been lost by root-killing, and the past season has been favorable for growth.

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In closing this report I feel that it would be incomplete, did I fail to make mention of a few names of those who have so earnestly and generously aided in the experimental work that has been done here.

A new generation is coming on who know but little of the trials and arduous, self-sacrificing labors of the pioneers in horticulture, and I feel that I would be untrue to you, and untrue to myself did I not give the due mead of praise to those, without whose aid and assistance and encouragement it would have been impossible to have done so much as has been accomplished at my station. If I remained silent it would amount to saying, that I took all the credit to myself, which would not be true. From the very inception of the discussions leading up to, even the asking for an appropriation for original experimental work, Colonel Brackett and Mr. Watrous saw its necessity and labored for its promotion. Colonel Brackett was the first one to come to my place, bringing pollen that he had gathered with his own hands, and together we planned upon what varieties we should use, this or that pollen. All of our older members know that he was always very modest and unpretentious, but he had a scientific turn of mind coupled with artistic skill, and he loved the work of plant breeding, and the larger effort in the artificial development of fruits, in the northwest, especially of the apple, dates from this beginning. From 1880 to 1890 it took a brave man to stand up against the fierce storms that raged in nearly all of our meetings, and it required a good captain to keep up the snow-breaks to prevent all from being buried under Russian drifts. And no man was so efficient or did so much to keep the prow of our horticultural ship in the right direction as did Mr. Watrous. Others later on have done their share in what now promises to be invaluable to the whole northwest. Space forbids to mention all, but you know Lathrop, Speer, Wilson and Fluke, the latter having done much at my place. We need only to be reminded of these things to graciously bestow honor where honor is due, and accord to each his full share of praise.

THE PRESIDENT: I will call on M. J. Wragg for his report.

REPORT OF EXPERIMENT STATION AT WAUKEE.

BY M. J. WRAGG.

I can say that I make this report before this honorable body with much more hope and much more enthusiasm than I did a year ago, as you will remember our reports one year ago told many doleful stories of blocks of root-killed trees, plants, etc., and in many cases the work in our stations for ten years past had been wiped out by the hard winter of '98 and '99. In our station I thought a year ago that there would be little left to report on, yet I find that many things have recuperated, and that the past favorable summer for growth has brought many plants and trees up to their original vigor. This is especially true of the plum and cherry. Most of the apples that had attained the age of three and four years that had been sent into the station are killed, and hence only reports of varieties of eight and ten years

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standing are left to report on. I am keeping up these records completely and will, in the future, hope to be able to give any information wanted, relative to the behavior of some of these new sorts that have been placed in my station from time to time.

Top grafting.—Four and five years ago, it will be remembered, that the Society encouraged the planting out of from fifty to one hundred apple trees on the stations of varieties that was hardy in tree with the view of top working, the object being to get some variety of the apple that would be hardy and at the same time congenial to the top grafting of some of our best standard sorts that were not hardy on all soils. At this time I received about eighty trees from A. F. Coleman, fifty Hass or Gross Primier. I planted out at the same time twenty-five Duchess, received from Chas. Patten, of Charles City. I also received from him four or five varieties of Russians, which he thought best for trying as stocks. Among them was Charlmoff and the few others. These trees are now five years planted and range in diameter from two to four inches, and are mostly ten to fifteen feet high. Two years ago I top worked this orchard with our best standard sorts, but for some reason, either the work was faulty, or the cions used were not in the best condition. At any rate, there was not over a two per cent. stand of top grafts As this orchard was lowered in vitality two years I did not do any work, but last spring I had a party sent from Ames college to top graft this experiment orchard complete, and I can report at the present that there is at least ninety-nine per cent. of a stand of grafts. The work was complete, and trees that the whole top was cut off last spring now present the appearance of a full top tree. So good has the growth been during the summer. Cions inserted last March made a growth of three feet by June 20th, at which time I topped them back, and they have at this time formed heavy side limbs. The experiment is along the line of grafting such varieties as Dyer, Williams' Favorite, etc., on Duchess. We also grafted a few trees of Duchess with Jonathan, Ben Davis, and a few other standard sorts, but the largest number were top worked to our best standard winter sorts, there being a record kept of the time of grafting, conditions of weather, and results. Some of the top working being done on limbs, others on central stems, I hope that from this orchard there may be some valuable lessons learned.

Five years ago I top worked Walbridge with Jonathan, selecting Walbridge trees with from five to seven limbs, and done the work of grafting out on the limbs about six inches from the trunk; such trees as these this fall had from one to two bushels of well matured, very fine Jonathan apples. From what I have seen of the Walbridge I believe it valuable to plant and top work with such varieties as Jonathan, Grimes, etc.

The Cherries in the station bore another heavy crop, which makes three crops in succession. As the season has been favorable the growth of wood has been very satisfactory. We will not make any report on any special variety, as there was no new varieties outside of the Baldwin sent out, and the trees of this were received in bad condition and did not grow.

Plums.—The plums on the station gave great promise of fruit during the early season, but as maturity of fruit appeared they became badly infested with rot, fungi, and mildew of leaf, which in a large degree destroyed the fruit crop. Some of the varieties of plums planted out three

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years ago gave us a sprinkling of fruit. Mankato, received from Minnesota, is a plum of good quality; very dark red, and is worthy of extended trial. New Ulm, and Ocheda received from Mr. Lord fruited heavy the past season, while they are both good plums, yet where the De Soto, Hawkeye, and Stoddard can be grown they will have nothing of superiority over these to recommend them. The Surprise produced a few specimens. Its quality is quite good, and a very rank grower in tree. I have no doubt but that it will have great value through the north. Barnsbeck from South Dakota will in my estimation prove valuable for planting in that section. While it is under size, yet its quality and good bearing will commend it. The Aitken has blossomed for three years but has had so little fruit that one could judge little as to its merits. It certainly belongs to some new family or strain of the Americana family, Its peculiar bud, and leaf makes it a novelty if nothing else. The Odegard, Golden Beauty and Bestofell fruited but little, and it being their first was no fair sample to judge the fruit by, yet I fear that the first two mentioned will be of but little value in the north. The Whittaker fruited well, and I am highly pleased with it, and believe it is one of the coming Chickasaw varieties. Beatty: this variety gives great promise; it is a pure Americana. Its Origin I do not know. I procured a few trees and placed in the station at my own expense. I hope to be able another year to give a fuller report on this very promising variety.

The plum that I named McKinley that was received from Lucas county and reported fully on last year, is going to prove a wonderful variety. It is a perfect free stone and in many ways would be taken for a Weaver, but it is very large and this year again the tree bore a wonderful crop.

Raspberries.—The past season was one of the hardest in many years on raspberries, owing to the prevalence of so many fungus diseases, which destroyed the canes in many instances. The worst disease we had to combat was Anthracnose. After fruiting the Progress another year we have nothing but words of praise. It was the best on our place. While the berry is small, yet its early fruiting and great quantity of fruit to the cane will make it desirable. I think such varieties as Kansas, Older, Lotta and Hilbern are holding their own and with us are the very best to plant. I placed in the station last fall fifty Cumberland raspberries, the same amount of Conrath, and received a variety of red raspberry from Storm Lake, which was called by the grower, Mr. Caulkins, a superior variety. He describes the fruit as red, and in leaf and growth of plant resembling a Cuthbert. He reports it as the very best red sort for his section of northern Iowa, and hence I procured a lot of plants and have planted them in the station. Will report another year.

In *blackberries* have nothing new to report outside of the old sorts.

Gooseberries.—The past season was very favorable for the bringing of this fruit to perfection. The Pearl is the only sort sent out in the station to report on. I am sometimes of the opinion that it is nothing but a good strain of the Downing. At any rate it is a valuable variety, be it Downing or some other variety.

Currants.—Another year has added testimonies in favor of the Pomona. We believe it one of the best of the red sorts. President Wilder fruited heavy with us this year, but nothing to recommend it as all the good points in this sort are included in the Pomona or Victoria.

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In *peaches* there is nothing to report from the station as all varieties were killed to the ground in '98.

Grapes.—As all our vineyards were killed out as reported last year by us left only reports for one and two year planted varieties, but will say that the vines planted out by the station in the last two years are doing very well, and we will have reports on these new sorts, we hope, by another year.

Strawberries.—The season was very unfavorable for strawberries, caused by too much rain at blossoming time. The varieties, like Clyde, Brandywine, and Barton's Eclipse, placed in the station three years ago, gave a good crop, and we certainly think that these varieties are going to prove of enough value that we can enter them in our standard list of the varieties received and planted during the last year in the station. Our Luther, Poconoke, Splendid, Bismark and Seaford, we hope to be able to report on these varieties another year, for at present they are very densely matted in the row and are covered already to go into winter quarters. The stock received the past spring has been planted out and done well. The grafts of plums that was sent, I top grafted into Americana sorts, using the Stoddard and Hammer to work on. The three varieties of cions received were Fosowattamie, Imperial and Cling Stem. These varieties have made a heavy growth, and they already set fruit buds so that we can report fruit, we hope, another year. I will have some crosses and seedlings of Pæonias, Phlox, Lilacs, and other flowers to report to this society another year.

Everything in the station is in good condition. Of course, the experience of two years ago made quite a break in our work, but we have set apart a couple of acres of land especially for this business on which is located the orchard mentioned above, on which I am carrying forth the experiments in top grafting, which will be reported to this society whenever reports are demanded.

A MEMBER: I would like to ask about the McKinley plum, whether it is a self-fertilizer?

ANSWER: Yes, sir.

QUESTION: Is it not like the Weaver then?

ANSWER: No; but they do resemble the Weaver; they are a valuable plum; they are a free stone. Mr. McKinley lives in Clarke county; he has had it in his pasture for ten years.

THE PRESIDENT: We will listen to the report of P. F. Kinne.

MR. KINNE: I have made no written report; I have nothing to report to this society. I had two hail storms in succession that completely swept all the work from the experiment station. This season, everything has recovered and made fine progress; of course, we had no fruit until this year, except a few scattering plums. All the stock, however, is in good condition for another season and I will say, that in another season, there will be probably somewhere in the neighborhood of two hundred or two hundred and fifty trees that will be in fine condition for top-working.

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REPORT OF EXPERIMENT STATION AT NEW SHARON.

BY A BRANSON.

This station in south eastern Iowa is in its fourth year, therefor has only produced a few specimens, except that plum trees bear profusely, of about twenty kinds; Wyant and De Soto most productive. Wyant we can recommend for general planting. Charles Downing top-grafted in Miner, a fine colored, good size, solid plum, and appears to be a good shipper. Hawkeye and Hammer are valuable. In the station we have a number of seedling apples on trial, a few specimens fruited, but not sufficient to note this year.

The few trees and plants sent by the Experimental Committee last spring were planted and well cared for and made a fine growth. The five named cannas received, bloomed profusely and continued in bloom till late in November, these were a beautiful sight.

Several varieties of peaches and plums as a present to the station from Stark Bros., also grew and made a fair growth. Other peaches, plums and small fruit have been added. Detailed report of these will follow in the years to come.

REPORT OF EXPERIMENT STATION AT GLENWOOD.

BY J. P. JACKSON.

The past season has been an unusual one, in as much as, it was very favorable early in the season for all plant growth. All plants set started well but later on conditions changed and the trees, plants and shrubs were almost at a standstill for a time during a period of drought, but later on as we began to receive copious rains everything started anew and seemed to take on new life and all stock received, with few exceptions, made a fairly good growth and are apparently in good condition for the winter. All other stock at the station made good progress.

List of stock received spring of 1900.

FRUIT.	VARIETY.	RECEIVED.	SET.
Plums.	2 Hunt.	April 30	May 1st.
Plum.	2 Curry.	" 30	" 1st.
Peach.	2 Mitchell.	" 30.	" 1st.
Clamatis.	2 Paniculata.	" 30.	" 1st.
W. Willow.	1 Thurlow.	" 30.	" 1st.
Suringa.	1 Pekeninsis Pendula.	" 30.	" 1st.
Grape.	3 Mcpike.	May 24.	" 24th.
Cannas.	3 Maple Ave.	" 31.	June 1st.
Cannas.	2 Chas. Henderson.	" 31.	" 1st.
Cannas.	2 Mottled Queen.	" 31.	" 1st.
Cannas.	2 Sun Set.	" 31.	" 1st.

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I also received some 12 varieties of peaches, 6 of apples, 2 of pears and scions of several varieties of apples and plums, 25 London market currants, 50 Ransom raspberries from Stark, some Deaton plum, 2 Banner crabs, none of which was sent by the committee but which is added to station stock for the benefit of the society.

Cross Fertilization.—This work was carried on to some extent the past season. About 150 crosses were made but only a limited number of specimens were obtained all of which have been sent to central station at Ames.

Spraying.—This line of work was continued again along the same lines as begun last season, by checking two trees of same variety, spraying one and leaving the other unsprayed. The results seemed to be very satisfactory during the growing season as to condition of trees and foliage, the difference being very marked but owing to the continued dropping of the fruit I cannot give my definite report as to quality and quantity as it had most all fallen before maturing. I also made a test with White Arsinic and Paris Green selecting two rows of trees side by side spraying one with White Arsenic, the other with Paris Green on the same dates. The difference was barely perceptible, if any difference it was in favor of the White Arsenic. There was some more apples on row sprayed with Arsenic, yet I do not consider this a fair test, and I would not recommend a change from Paris Green to White Arsenic until further tests have been made. I hope to be able to continue the test next season with more definite results.

I wish to state to the society that my station has only been established two years. That is one reason why I do not make any more of a report than I have here. We have quite a good deal of experimental work outside of our grounds, outside of station work. There wasn't very much to report on this. Perhaps by next season I will make more of a report. I have about fifteen or twenty varieties of strawberries, and some varieties of raspberries. I know the habit has been heretofore, in some cases, to overdue our reports, and in that way crowded our general reports.

REPORT OF EXPERIMENT STATION AT CEDAR FALLS.

BY R. P. SPEER.

All of the American cherries have proved to be very tender in northern Iowa on orchard site like mine, when the water level is from 140 to 150 feet below the surface of the ground. Many of the Russian cherries have proved to be hardy in my orchard; but none of them are productive, except the Spate Amarelle and No. 23 Orel. I have now sixty-three seedlings of the Spate Amarelle, nineteen seedlings of No. 23 Orel and twenty-four seedlings of the Cerise de Ostheim cherries—all of which were planted in the spring of 1894. Not more than seven of them have shown any signs of being tender. Five of the Cerise de Ostheim and eleven of the Spate Amarelle seedlings are productive and very promising; but none of the No. 23 Orel seedlings have produced any fruit. I am confident that several of these seedlings would give perfect satisfaction in any part of Iowa.

I have fifty-five seedling apples, which were produced by crossing some of the best American apples on hardy Russian apples in 1889, and they were

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top-grafted on the Whitney in 1892. In 1898 and '99 some of them produced apples; but last summer nearly all of them were full of fruit. One of them is a very good yellow sweet September apple of good size, on which I received a premium of $6.00 at the last Iowa State Fair. Another seedling is very early and productive, of medium size, and it suits me better than the Carolina Red June. A half dozen of them are fall apples of good size and quality, and several others are fairly good early winter apples. Most of these seedlings appear to be well adapted to the Whitney stocks. I have good scions now of apples, which were produced in 1899 by cross fertilization as follows, viz: three Alexander on Briar's Sweet; eight Arabka on Ben Davis; thirty-three Vassil's Largest on Ben Davis; ten Resonant on Ben Davis; and eighteen Vassil's Largest on Willow Twig. I have about sixty thrifty young Romna apple trees on which I will graft the above described scions next spring. Several years ago I top-grafted about fifty of the best American apples on forty-two kinds of the most thrifty trees in my trial Russian orchard for the purpose of determining what kinds of trees are the best stocks for other varieties. As a stock the variety now called Speer is extra good, five or six of the others are as good stocks for other varieties as the Whitney; while the others are not good. I have five Mercer crab trees, which were full of fruit last summer. I found by cooking them, that they stew down like common apples. I am well satisfied that it is a cross between the wild crab and a common apple. It is hardy, a good keeper and away ahead of the Repka Malenka in other respects. The Early Colton is one of the most desirable apples which I have fruited.

I have tested a great many kinds of plums, but for hardiness, vigor, size, quality and profit, I would place the Wyant at the head of the plum list, and the Aitkin second. When a new plum is not as large and good in other respects as the Wyant and Aitkin it should not be sent out for trial. The De Soto is a good plum, but it is entirely too productive, and the trees do not live long enough. The Wolf, Rollingstone and a dozen other popular plums are not wanted by men who are well posted on the different varieties. I have four Bailey peach trees, which come through last winter in fairly good condition and produced more than a peck of fruit.

MR. CALLISON: I have not been a member of this society very long. I do not know that I ought to presume to speak, but I want to make one or two suggestions. It seems to me the society has to do something to popularize itself and to reach the people. You meet here every year and report the results of the experiments and assist each other. You do not need any instruction; it is the people that need the instruction. In these volumes is recorded information that would be worth thousands of dollars to the people of Iowa. It is astonishing how much money is lost, because people do not know how to care for trees. If the state does not furnish funds to distribute this information, let us get down in our pockets and do it ourselves. Another thing I am going to speak of. It seems to me we ought to have a county organization. Now, take for instance this meeting: If we had

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a good lively local organization here, that could have met you gentlemen here at the train and made you feel at home. It looks like a pity to wait a year.

SILAS WILSON: I wish to say a word, and what I am going to say is going to be said in all kindness. Now, Mr. Callison read a very excellent paper on roses. Those of us who are lovers of roses appreciate what he said. Would it not be an excellent thing to strew some of those roses along the pathway of the men that have made this society a success? I have in mind one who belongs to our society, with whom I have had the honor to ride across the continent to the Pacific coast, to the Golden Gate. He was a man who was looked up to everywhere; a kind man; a gentleman in every sense of the word and possessing the very elements that go to make up a model character. I had the honor to serve with him on committees awarding fruits in tne American Pomological Society, at Sacramento, California. I think it was well said by Major Holsinger, we received one continuous ovation when we entered that state; everything was free as the air we breathe. Then I have been with this man on the other side of this great country. He now occupies a position as Chief of Pomology of this country; a modest man that never did any log rolling to get a position. There are men of equal ability over this country who have expressed to me personally the fact that it certainly was no mistake in Secretary Wilson to place him there on his merits. He is as faithful as any man I ever knew. Now, he is an old man. Wouldn't it be well for this society at every opportunity to strew a few of these roses we all admire so much in the path of this man?

We have another man in our society, whom I have seen in a great many places at a distance, who has reflected special credit, not only upon the pomology of the United States, but upon the state of Iowa, whom we all love. I was at Philadelphia when he presided over the American Pomological Society. Every act that man did and every word that he uttered there was admired and commented on; he was so kind and such a young man to occupy a position of that kind. In fact, I heard it stated by old men of New Jersey that they did not think such young men ought to preside in that position, but they admired him. Now, then, we had another man there that this society honored by sending him as a delegate. I want to say that man honored this society. He read a paper there upon which I heard comments that simply made me feel proud of him. He is a modest gentleman, a kind

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man. I heard expressions, such as, the west is up to date. Such comments were heard on all sides. As one of the members of this society, I desire to say that these are my feelings in regard to what I know of these men and their standing from one end of the country to the other.

W. G. GANO: In the opening exercises of this meeting I was called on to make some remarks. You kept firing questions at me, and I, like Prof. Robertson, wanted to kick. I have been quoted as saying that fruit growing was a failure in southern Missouri. Now, gentlemen, do not for a moment quote me so. I did not say it was a failure. I say, there have been mistakes made there; obstacles have come up greater than we anticipated. I stated also if I was going to change my location for fruit growing I would go towards the Iowa line, rather than the Arkansas line. Now, my visit has been pleasant. I shall go away from Des Moines with very pleasant recollections of the Iowa Horticultural Society. I wish every member the kindness that has been extended to me. I want the Iowa Horticultural Society to come in closer touch with us. I extend to you, in the name of the Missouri State Horticlutural Society, a cordial invitation to visit us.

A. F. COLLMAN: I was glad that my friend just said what he did. I was highly entertained in the Missouri meeting. I am glad Mr. Gano corrected the statement that Missouri was a failure as a fruit country. I know he can grow fruit there; so can we here. I think Iowa and Missouri ought to work together for a common interest. Our climate is not very different. Our current down the Mississippi River makes the seasons almost as cold.

FRANK HOLSINGER: Inasmuch as this seems to be a sort of love-feast I, too, have a word before bidding adieu I am glad I was here, because I enjoyed the meeting very much. If there is any mission grander than any other, I think it is to be engaged in the delightful occupation of horticulture. It has been my good fortune to have been engaged and associated with horticultural societies all over the country. I have been quoted as making a remark about that elegant expedition we took to California, which was, I think, the grandest occasion I ever experienced. We saw California at her best; we were treated everywhere; they sent special trains away out into the desert to meet us with the good substantial things of life. Now, if we could get together to the Buffalo Exposition and take in the great fruit regions of Michigan and New York, we could have a good time. I was pleased at the roses that have been spread upon the living. I

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was thinking at the time it was said, better a little taffy now than so much epitaphy later. These are beautiful things to say.

In conclusion, let me say once more, the Kansas meeting will be held during the holidays. We will welcome you with open arms; come to us and we will welcome you as best we can.

M. J. WRAGG: If there is one thing above any other I like to hear, it is these references to roses; these kind words; these encomiums. I believe if there is any place to throw these boquets, it is here while we are living. I am glad Major Holsinger is with us. I am glad the state of Kansas saw fit to send a man with such a wide reputation. I had the pleasure of passing through the state a few weeks ago, and was waiting at one of the depots in Kansas City. It struck me that he did not live very far in Kansas. I went out, and I want to tell you I was surprised—I supposed he lived way out on the flat somewhere. When I got off the cars and a man pointed away up on the rocky hillside and said, "Do you see that barn and big vineyard?" He says, "There is where Major Holsinger lives." I knocked at the door; went around the house and saw an elderly man in the barn yard shoveling manure. I asked if he knew where Major Holsinger lived. He says, "Yes, sir; I am the man." He went down to the house and took off his boots; we went in and just talked until noon; dinner was served. It was in November, I believe. We ate grapes—Concords and Wordens. He showed me through the beautiful vineyards on the hillside. I tell you, gentlemen, I got an inspiration from that visit. I hope that he will carry back to the state of Kansas some kind thoughts and remembrances of his visit here.

ELMER REEVES: I think this society has been particularly fortunate at this meeting in having the delegates with us we have. We come here to pump information out of each other. I know I have applied the pump to some of these delegates at different times, and always got some valuable information from them. On the simple matter of growing asparagus I got some good ideas from Major Holsinger this evening, as we were going up on the street car. I am glad they came.

In regard to the remarks of Mr. Wilson, I was glad to hear him say just what he did. So far as my knowledge of the circumstances goes, I can heartily endorse all he said, and am glad that these sentiments have been expressed here. I am glad to know we have men among us, noble men, who are so well and favorably known from ocean to ocean.

Upon motion the Society adjourned

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ADDITION NOTES AND PAPERS.

Papers not read in the regular order, or were not received in ime, are placed under this heading.

REPORT OF EXPERIMENT STATION AT STORM LAKE.

BY P. F. KINNE.

Owing to very adverse conditions I can give but a very meager report from this station. In the spring of 1899 I received cions of twenty varieties of apples and five varieties of plums. Top-worked the apples on Hibernal and Recunbent and plums on native varieties. On the 29th of May the experiment grounds was visited by a hail storm so severe that it completely defoliated the trees and knocked out all but eleven of the apple cions and so loosened the bark of the trees that they barely recovered during the season and they made but slight growth, so that for the spring of 1900 the vitality was so lowered that the few cions set in spring of 1900 pushed very feebly and were again visited by hail that made a complete failure of them. The season of 1900 was, however, so favorable that the trees made a vigorous growth, but, with the exception of a few specimens of plums, the experiment grounds furnished no fruit from the tree fruits. No gooseberry nor currants owing to hail, and a very light crop of raspberries.

Received at station spring of 1900:—

2 Mitchell Peach.
2 Hunt Plum.
1 Oren Plum.
2 Clematis Panticulate.
2 Rudbeckia Golden Glow.

Two Curry plums were billed but not in the package, but, instead of them one Oren, all grew but one of the Clematis. All stock on the ground made a fine growth.

REPORT OF THE EXPERIMENT STATION AT DES MOINES.

BY C. L. WATROUS.

From the Society I planted a pretty full set of the Munson Hybrid grapes So far they promise to be hardy in this northern region. Also McPike, Campbell Early and some others. One peach was planted this year which

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is growing all right, the Mitchell, also the Hunt, Oren and Curry plums—all doing well. A new weeping willow called Thurlow, originating in the east, promises extremely well in this region although we have had no test winters of late. Clematis Paniculata seems to be a strong grower and hardy. Golden Glow—Rudbeckia—lives but I doubt if it will do very well in this soil and climate.

I top-grafted in bearing trees and secured several living grafts of each variety of about ten hybrid plums and of about twenty other sorts, not hybrids but supposed to be promising. About twenty new apples were started during the year, most in nursery because I am confident that no apple which has not vigor and adaptibility enough to enable it to make a vigorous and healthy nursery tree can ever be of much value in this climate.

HORTICULTURISTS SHOULD STUDY CAREFULLY THE LAWS OF NATURE, WHICH GOVERN LIVING TREES AND HERBACEOUS PLANTS.

BY R. P. SPEER, CEDAR FALLS.

There are but few of the apples, plums, and cherries that are valued highly in the northern states; which would not ripen at the proper times, and prove equally satisfactory in other respects in Iowa, if we should give them proper care during the growing seasons. Many of the fruit growers in Iowa have not been successful, because they have given but little attention to the natural wants of their trees. What are their natural wants? And how should they be treated to cause them to be hardy and fruitful? are questions which I will consider briefly.

When the winters are cold, and the spring seasons are changeable, Nature has provided that trees should ripen at the close of each years growth. The ripening of trees is an important process, and entirely too little attention has been given to it by western fruit growers. Although I have described the process several years ago, it is of so much importance that I will call your attention to it again. When trees are ready to complete a summers growth, they withdraw all of the sugar, starch, albuminoids and other nutritive substances from their leaves and other parts where growth is going on, and store them away to be used in starting growth during the following spring. The hardiness of trees in a cold and changeable climate, can be determined more accurately by the different conditions or stages of ripeness after their leaves have been killed by fall frosts, than by anything else. When trees are thoroughly ripe, all of the carbohydrates, (sugar, starch, etc.) which they contain, will be concentrated in granular form in their piths and medullary rays. In a ripe tree the pith terminates in a comparatively large and well defined cone of lignified starch grains from a fourth to a half inch below each terminal bud, and a much smaller cone of lignified starch can be found below each lateral bud. The lignin is used to prevent access of water to the granulated starch during spells of warm weather, which occur early in the spring frequently. It is permeable, but water passes through it much

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more slowly than through unlignified grains of starch or sap-wood. Growth cannot begin in trees until the grains of starch are dissolved; but as they are well protected in ripe trees by lignin, growth cannot begin during the short spells of warm days and nights, which occur frequently in March and early in April. When the leaves of trees are killed by frost while they are growing, no granulated starch can be found in their piths; but sugar and ungranulated starch can be found in their leaves, inner bark, cambium layers and sap-wood. Very short spells of warm weather in March would be sufficient to start growth in such trees; because the different kinds of assimlated plant food materials were left, when growth was stopped by frost, in the right parts of the tree and in proper condition to start growth, as soon as the conditions of the weather would admit of it.

During the ripening process all of the albiminoids in a tree are stored in its buds in concentrated form, where they are well protected by bud scales, and in its sieve tubes outside of its cambium layer. Vegetable physiologists tell us, that during the ripening process the perforated points on the sieve tubes are closed to prevent water from coming in contact with the reserve albuminoids which they contain, at improper times. But when trees do not ripen in the fall the perforated points on the sieve tubes will remain open during the following winter, and albuminoids will be found scattered at all points of growth in their limbs and bodies in a watery condition. Numerous small, light colored spots are noticeable on the bark of young branches of trees. They are small openings in the bark, called lenticels, through which surplus aqueous vapor is discharged from the intercellular spaces in trees, and through them carbonic acid and other gases are absorbed from the atmosphere to assist in promoting growth. The lenticels are closed during the ripening process in the fall, but they open again when new leaves begin to assimilate plant food during the following spring. When trees do not ripen in the fall their lenticels will remain open all winter. Again, a layer of thick walled, cuticularised cells is formed during the ripening process where each leaf stalk is attached to a branch, for the purpose of preventing loss of water during the following winter.

But, we will suppose that a tree does not ripen in the fall, then the number of small, unhealed wounds on its branches would be equal to the number of its leaves. When the ripening process is completed in the trees it is impossible for them to start growth again until they have passed through their winter period of rest. I have placed pieces of the cions of many kinds of ripe apple trees, and other kinds of trees and shrubs, in a cutting bench in my greenhouse on the first day of December, but I found that with the best care, and the most favorable degrees of heat, moisture and light, it was impossible to make them show signs of life until about the first to the tenth of February.

We know that sudden thawing will kill the roots of ripe or unripe trees, but long continued cold weather in January cannot kill a ripe apple tree if the frost is allowed to come out of its roots slowly. We have had warm spells of weather in March frequently, which started growth in unripe trees, while warm weather for two weeks or more would have been required to dissolve the lignified, granulated starch and other well protected reserve food materials in ripe trees, and make it possible for growth to begin. The Duchess, the crabs, and many of the Russian apples are hardy in Iowa,

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because they ripen every year, while many of the American apples are tender, because they go into the winters frequently in an unripe condition. It is well known that the ripening of fruit trees, corn, and other kinds of plants, is hindered very much by unfavorable surrounding conditions during the growing seasons, and that they ripen earlier than usual in years when they are well supplied during the summer months with moisture, heat, and sun light. Generally our fruit trees make satisfactory growth until the first of July, but afterwards they grow but little for weeks, frequently, on account of drouths and a lack of dissolved plant food. If we knew more about the natural wants of trees we would make fewer mistakes and have more profitable orchards.

To guard against losses, it is necessary that tree planters should know the difference between good and poor orchard sites, as the latter are the most numerous in Iowa. A scarcity of water in sub-soils during dry summers has caused many more orchards losses than cold winters. The crude food materials which trees require consist of nitrogen, potash, phosphoric acid, lime, etc., and there is enough of such substances in the uppermost twelve inches of most of our fields to supply the wants of 150 to 200 good crops of wheat, oats or corn, without saying anything about their presence in the sub-soil. But in soils they are found united in the form of compounds, which cannot be used by trees or herbaceous plants until they are dissolved, but only a very small per cent of such substances can be dissolved by water. To dissolve them fast enough to supply the wants of trees and other plants, it is necessary that atmospheric air with the moisture and carbonic acid gas, which it contains, should circulate freely through the soil. Very wet or very dry compact soils are unsuitable for orchards, because the air cannot circulate freely through them. Soils which are porous to a considerable depth, and shaded by a dust mulch, coarse stable manure or straw are best, because the temperature of such soils is low enough to condense much more atmospheric moisture frequently in July and August than falls from the clouds in the form of rain. Clover is a good crop in an orchard, as it not only makes the soil richer, but it causes its temperature to become low enough to condense much atmospheric moisture in it. Buckwheat is also a good crop to shade the soil and keep it porous and moist; while blue grass or timothy would cause it to become harder, warmer, and dryer. Water is brought upwards through soils by capillary attraction, and the best orchard soils have great capillary power. A soil which is composed principally of fine clay has low capillary power, because the particles of which it is composed lie so near each other that water cannot rise rapidly between them. And a soil which is composed principally of coarse sand has low capillary power also, because the spaces between the grains of sand are so large that thin films of water are not attracted equally on all sides. The best orchard sites are where the water level is not more than from thirty to forty feet below the surface of the ground, but on thousands of farms in Iowa it is necessary to go down from 75 to 150 feet to find it, and generally it is found under extensive bodies of impervious blue clay or hard pan. On such soils apples, plums, and cherries cannot be grown successfully, unless human skill and labor is used to provide the necessary water.

Water and atmospheric air in sufficient quantities to dissolve the inorganic plant food materials in the soil are necessary, and water is the vehicle which

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nature uses to carry them from the soil to the leaves of trees, and from the leaves after being assimilated to all points of growth where they are needed. The dropping of the fruit of apple trees prematurely on account of a scarcity of water in the soil is not uncommon, and I have seen the lower leaves of trees turn yellow and fall to the ground early in September for the same reason. It is not remarkable that neglected fruit trees do not complete their growth and ripen at the proper time on poor orchard sites, but it is strange that many of them do not die during long continued summer drouths.

Fruit trees should be planted on every farm, but before planting them, we should know whether our soil and sub-soil were suitable for orchards or not. When they have great capillary power, and the water level is not more than from thirty to thirty-five feet below the surface of the ground, it would be safe for careful and industrious men to plant commercial orchards; but where they are not good, I would plant only a limited number of apples, plums and cherries for home use, and I would not forget before planting such orchards that three fourths of our losses have been caused by scalding of the bark on the bodies and in the crotches of unripe trees on poor orchard sites, and by root-killing where trees were not planted deep enough.

For home use, I would want a few root-grated trees of such hardy varieties as the Duchess, Charlamoff and Briar's Sweet Crab for defective soil; but other less hardy varieties should be top-grafted on the Virginia Crab or the Whitney, as they are good stocks for other varieties, are very hardy and do not bark-scald. In an orchard we should try to provide and maintain the same soil conditions that are found in a wild forest, which are very different from the conditions of the soil in Iowa timber lots, where cattle are allowed to run and browse the hazel bushes and small trees during the summer seasons. In a forest where no conditions have been changed by man, the soil is shaded not only by many tall trees but by dead leaves and different kinds of undergrowth. Under the dead leaves in such a forest large quantities of vegetable mold can be found, which is a poor conductor of heat, and it attracts and holds water like a sponge. In such soils sufficient quantities of the different kinds of inorganic plant food are dissolved every day, to supply the wants of the forest trees, and every year they are ripe and ready for winter. But generally there is very little vegetable mold in orchard soil, and nothing to shade the ground except weeds and grass, which consume much more water than the fruit trees. Vegetable mold is necessary, even in the best orchard soils, and we can have it at small expense by using stable manure or straw around our trees liberally and by cutting down crops of clover, buckwheat, etc., and letting them remain on the ground. Many fruit growers enjoy work in their orchards, but let them enjoy it or not, the necessary care must be given, and the necessary work must be done, or the trees will soon become unhealthy, unproductive and unprofitable.

FIGS IN IOWA.

HENRY SCHROEDER, SIGOURNEY.

This is a subject about southern fruit one way and the other way, like Christ said, not to gather grapes from thorns or figs from thistles, it don't ask for any climate and has its value around the earth.

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No difference what your subject is, better show the truth, as fresh, ripe, sweet figs; or else after it, sometime the truth will show itself too, but like bitter, rotten figs. Tell the truth while you live. You cannot do it so well later, and if you are mistaken, the discussions at Iowa's Horticultural meetings will help you. Still better, if any one finds something in the reports they don't like, or do not understand, bring it into discussion, to clean the reports from bitter, rotten figs into ripe, sweet figs. In the last report, page 27, our secretary states:

"More members needed. To make these reports and statistics more complete, this office needs a live correspondence in every township in the state." I asked him lately about it, why not better to help him by making every member a life member who had paid for five years. He answered that article 8 would have to be changed. As it is now, it is a good deal like the Titus Amendment, not for live members who work and pay five years, but against live members who die inside of five years, to get their $5. The less who live, the more money for a few against horticulture.

Now the subject, Figs, calls us back to our horticultural meeting at Sigourney when Capt. Watrous called for profit and failure, for and against Russian fruits in Iowa. So the same with figs and others. In 1893, I planted three different varieties of figs, but they never bore fruit. In 1898, one of my friends wanted to try some and I got the three hardiest varieties and larger plants for him and me to try, but the cold February, 1899, killed all after they were covered good and bore fruit the first summer here. Now instead of calling such a loss with figs in Iowa, it learns us that to make it profitable they would have to be raised in boxes and kept over winter in cellars or buildings. The main point would be like with flowers. Better to spend time and money with it than to spend work, time and money for devilments. It would pay for fruit too, if we had such a market here as in Paris. Like the *State Register* last November stated, about a four year old cherry tree, three feet high, in a large pot, forced in a hothouse with 100 cherries on, for the dinner table, and the guests plucking the fruit from the tree themselves at a cost of $4.00 a pluck.

It has been a riddle to me when pears first got to be known. In the bible we can read about figs, grapes and other fruits, but I think pears are not mentioned. Looks like a hardier improvement for figs. We take like Luke 13, verses 6 to 10, the same with Standard pears in Iowa. They make us wait longer for fruit than dwarfs which soon die from overbearing.

If the society had stuck to this when they offered the four district societies $150 per year, and some of it to be used as for every county experimental stock, then we could report better. Like now in last report, page 172, Captain Watrous puts in the rejected list the Sugar pear and ten other Russians all blighted to death or winter killed. Looks like the Sugar pear trees are gone, like in the bible the fig tree. But if I am not mistaken with Sugar pears, he means the German Zucker Birne. I have them here yet so far without blight, but like the fig tree in the bible, we had to wait for the fruit. They don't bear early. The first one I got from the society in 1892 and in 1894 bought two besides from Professor Budd to try on cold and warm locations. They do well on both so far.

Now I had a good neighbor for horticulture north of my place who sold out and moved. After a few years he could not find a better place to suit

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him than to come back and buy some of my land. I told him that I had planted this Sugar pear tree because it was trusted to me to report about it sometime. Well, he would take care of it, to keep it growing, as well as if I did, so I could report. I sold him a lot and this year the tree bore the first little sweet pear and he divided it. Ripe in August. I asked him the other day how much he would take for the tree now, twenty-two feet high and six and one-half inches in diameter, but he would like the tree better than $10. He had a fig tree three years in a box and it never bore fruit, while he could buy pear trees of me, moved them carefully, and raised pears the first year. But the Sugar pear tree, if it never bore, he would like it better for ornamental shade than many others. They grow straight like poplars, stand storms better, and the foliage is nicer than figs or poplars. Besides in Sigourney we were glad when, in the dry years, many cotton trees went down, having before their seeds and wool flying in every direction. But after one agent was here some planted poplars again and paid higher prices for it than pear trees. Will they ever raise figs on poplar trees?

I believe there are more pears, fresh, canned and dried shipped into Iowa than figs. Why shall we then not raise more pears? Ten years ago when the state society showed itself against the Keiffer pear, I did not blame it, for the north part of the state. But for here at home I did not give up to recommend it to my friends here, and now after the cold 1899, she tells me, "I pay you for not being hard against me, like the state society was in too big a hurry."

If you are in a big hurry for pears like figs, then the Japan Golden Russet, with its nice leaves, flowers and fruit, will show on the table better as the cherry tree in Paris. I had one in 1900, with thirteen pears, only three feet high. But the fruit is not so large and good as a French variety about which I answered in the *State Register*, February 10, 1898, just before the cold. By planting them deep enough, so they grow on their own roots, they will last longer than on other grafted roots, but not bear pears so soon, for they grow more into wood. Like the old story about the Frenchman, observing his servant about to destroy a fine, thrifty pear tree, he inquired the cause. He was told that it was a chance seedling and had borne no fruit. He had already cut its roots preparatory to the first stroke, but was ordered to let it remain. He did so, and in the following year it was loaded with superb fruit of an unknown variety, which at once became celebrated. The root pruning the gardener gave it worked like a charm, made the tree bear; like here at Sigourney, the same variety does well and bears when only four feet high on my place. Now I am trying with the same variety planted in 1894, only four feet apart on the same soil, to see which pays best with two trees. One is planted on quince roots and bears every year now, before eight feet high. The other on quince roots, too, but planted deeper, to make it grow on its own roots; but it never bore a pear yet; is over sixteen feet high and so thick in body as if double that age. From twelve other varieties, about the same height and age, I raised a good crop of pears in 1898. Besides Keokuk county has some pear trees over forty years old and I measured one, one foot above the ground and it was around it, over fifty inches.

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THE OUTCOME OF CROSSING FRUITS AND SHRUBS IN THE NORTHWEST.

BY J. L. BUDD, AMES.

In this vital important work two leading principles have become quite well established: (1.) The very hardy prepotent variety crossed with pollen of a mongrel variety will mainly follow the prepotent variety in leaf, bud, habit of growth, and hardiness, while the fruit will be modified and usually improved by the mongrel variety. (2.) The most valuable results follow the crossing of nearly allied varieties and species. In no case has the writer known seedlings coming from a violent, or far removed, cross to bear valuable fruits or popular flowers.

PREPOTENT PISTILLATE VARIETIES AND SPECIES.

What is meant by prepotent female parents in crossing is simply that nearly fixed varieties, that come near to reproducing themselves from seed, such as Duchess apple, Spate Morello cherry, German prune, some peaches, and some species such as Wyant plum, Concord grape, and Champion gooseberry, that are near to Nature are most likely to transmit in crossing with a mongrel variety their leading peculiarities of leaf, bud, habit, and hardiness.

What is meant by "mongrel" is mixed parentage which includes a large part of our cultivated fruits. As for instance, if we plant the seed of Grimes' Golden, Jonathan, or Osceola, we know from experience that we are quite certain to secure more thorny, worthless seedlings than fairly good varieties.

To illustrate from actual practice three or four examples are given.

(a) In the spring of 1888 we crossed the blossoms ot the Silken Leaf with pollen of the Osceola and Roman Stem. The Silken Leaf was selected as a pistilate variety as it very nearly reproduces itself from seed and has proven hardy even in north Minnesota and Manitoba. In addition it is a large, smooth, striped apple ripening in autumn of best quality for culinary use. The Osceola and Roman Stem pollen was used as they are good keepers and high in quality.

The resulting seedling follow the Hibernal family in leaf, bud, habit, and hardiness very close as tested at the far north, while the fruit so far as yet tested follows quite close the male parents with increased size, color. and keeping.

(b) About the same time we crossed the pollen of the De Soto plum with pollen of a Japan variety received from Oregon. In this case the hardiness of the De Soto had been fully retained and the leaf has been increased in size and firmness and the buds are often triple as in the Japan species. The fruit has also been improved in size, firmness of flesh, and quality, of No.

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3 of this cross Professor John Craig says in Bulletin 46 of the I. A. C.: "Fruit round, conical, size one and three-eighths by one and three-eighths, suture fairly outlined; flesh light yellow, fruit firm; flavor sugary, rich; quality good to best. Tree vigorous and hardy, intermediate in character."

(c) We crossed several years ago the blossom of the wild gooseberry received from Manitoba with pollen of the Champion. The resulting seedlings (about one hundred in number) are all remarkably vigorous in growth, have larger leaves than either parent, and all bear larger and better fruit than the Manitoba variety, and some bear fruit as large as Champion. In this case both parent were near to nature, but the Manitoba variety was most prepotent as is indicated by the buds of the seedlings and the fact that they prove hardy far north of the point where the Champion can be grown. Not a trace of mildew has been detected on their seedlings.

(d) In 1892 we crossed the blossoms of the Russian *Rosa rugosa* with pollen of General Jacqueminot. Fifteen of the seedlings of this cross followed the Rugosa quite closely in leaf and habit but with stronger growth. Of this number all had from fifteen to sixty petals varying from dark pink to the crimson of the male parent. The I. A. C. of this cross has twenty more petals than General Jacqueminot, larger and firmer petals and some crimson color. Even the single flowers of this line of crosses nearly all exhibit the peculiar crimson of the Jacqueminot. Bulletins Nos. 3, 14, 22, and 36, of the Iowa station give notes on a large number of crosses in which the vigor and hardiness follow the iron clad mother while the fruit or flower follow largely the mongrel parent.

Violent Crosses; Our extended experience fully agrees with that of all other experimenters in Europe and America in regard to the outcome of crosses of widely differing varieties and species. Yet a few items from our experience may prove useful as a guide.

(e) Several years ago we crossed the blossoms of *Pyrus taringo* with pollen of the Wythe. The *Pyrus taringo* is a mere bush with low rounded top and its fruit is not much larger than a pea, yet it is an iron clad very near to nature and peculiarly prepotent. The seedlings are upright in habit, quite rampant in growth, and the leaves are much enlarged, but the fruit is not larger than a small crab but with many of the characteristics of the Wythe as to shape, color and season.

(f) At the same time we crossed the blossoms of *Pyrus ringo* with pollen of the Duchess. The *Pyrus ringo* is the native wild crab of Transylvania, Europe, with large thick leaves and large growth of tree. The resulting seedlings show a remarkable transformation in leaf, bud, and habit of growth. But the fruit is not larger than the parent but it shows the striping of the Duchess.

(g) We crossed the blossoms of the Soulard crab with pollen of the Roman Stem. The Soulard is a very strong growing variety of our native crab (*Pyrus coronaria*). We performed the work on the first blossoms and used extra care to prevent self pollination. In over 100 crossed apples we did not find one perfect seed showing the cross to be very violent. In this case the crossed fruits had the shape, markings and color of the Roman Stem. Some specimens in alcohol are yet retained in the Botanical Department at the college put up by Dr. Halstead. Other crosses of our native crab have apparently given perfect seeds, but the leaves, buds, and fruit of the result-

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ing seedlings suggest self pollination which can only be prevented with our native crab by pollinating the first blossoms that appear.

(h) We crossed the blossoms of our wild roses (*Rosa blanda* and *Rosa Arkansana*) with pollen of General Jacqueminot. The resulting seedlings followed the prepotent natives very closely but we have never had a perfect flower. In several cases the buds showed from 20 to 80 petals of nearly the color of General Jacqueminot but they never expanded fully in a single case. The cross is too violent.

(i) We crossed the blossoms of the native wild strawberry of Manitoba with pollen of our best varieties. We grew several hundred seedlings that bore fruit two seasons in succession. The plants were all very vigorous, with leaves larger and thicker than the wild species, and all the fruit had the aroma of the wild berries of the north. But not a single plant gave fruit large enough to justify propogation and planting.

A FEW EASY AND PROMISING CROSSES.

With the experience now at hand it can be safely said that the following crosses can be made by the novice with valuable results:

(1) All our best varieties of the apple cross readily with the hardiest known varieties.

(2) All our best pears cross readily with the hardiest Russian varieties.

(3) Our best native plums cross readily with the Japan varieties giving in all cases interesting and valuable varieties.

(4) All our best cherries cross readily with the hardiest known varieties.

(5) The best known grapes cross readily with our best native varieties,

(6) Our best known foreign gooseberries cross readily with our cultivated native varieties and even with our wild varieties.

(7) The General Jacqueminot crosses readily with Rosa rugosa. This is by no means a complete list but a safe one for amateurs to work on without losing faith in the work.

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SOME NOTES ON FUNGUS DISEASES.

BY ELMER R. HODSON, AMES.

In looking around for a subject of interest to horticulturalists, it occurred to me that a few notes on the more important fungus diseases of fruit trees would not come amiss. Accordingly, I have given the description, occurrence, the present season and treatment of seven diseases.

These diseases are present in this state, and do more or less damage to fruit interests every year. A few of them are not destructive at the present

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time in this state, but have been in the East, and it is well to be on the lookout for them. I believe that spraying is still looked upon in this state by some as impracticable. I think this is largely from the fact that widespread destructive fungus diseases are comparatively new and it is hard to realize the necessity of resorting to costly methods of treatment. That treatment does pay in the majority of cases, is without question. To prove this, it is only necessary to turn to the history of fungus diseases in the East and in European countries. Thousands of dollars have been saved annually, and in a number of cases what would have been a total loss, was changed to an abundant crop. Of course, everything must be taken into consideration. If the profit on a full crop will not warrant the additional cost of spraying, then it is useless to spray. However, this will seldom be the case. When a crop is profitable at all, spraying, if necessary, will usually be profitable.

Among all the methods of treating diseases, prevention is, of course, the best. This can be secured as regards fungus diseases by rotation of crops and by proper culture in order to keep the plants in as thrifty a condition as possible. Where rotation is not possible, the diseased material should be cut out and destroyed. Along with the removal of diseased material spraying should be practiced in order to destroy the spores and mycelium of the fungus diseases.

Some of the spraying solutions are given below:

Boreaux mixture—

Copper Sulphate	3 lbs.
Quicklime	6 lbs.
Water	50 gal.

Ammoniacal Copper Carbonate, stock solution—

Copper Carbonate	5 oz.
Ammonia at 26°	3 pt.

For use, dilute with forty-five gallons of water.

Potassium Sulphide Solution—

Potassium Sulphide (Liver of Sulphur)	3 oz.
Water	10 gal

Other formulas are given with the descriptions.

BROWN ROT OF PLUM, (*Monilia fructgena.*)

This disease is very widespread and destructive to both plum and cherry. It is a cause of great loss to growers throughout the country. For this reason, it has attracted a great deal of attention from mycologists who have studied it with a view to finding the cause in order to combat with it. The cause had long been known as a species of fungi, which attacks not only the fruit and destroyes it, but also the flowers and young branches. The trouble may be recognized by the following characteristics: When a flower is attacked there is at first a slight discoloration which rapidly increases, giving the flower a brownish hue. The pedicels or flower stems are next attacked in a similar way. The dead flowers remain on the tree for a long time until they are beaten off by rain, and as they are highly infectious, these rotten flowers falling on the leaves and fruit, spread the disease.

The first appearance of the fungus on the leaves is characterized by a slight discoloration at the point attacked. This slowly enlarges and the color becomes reddish brown. The spots are on both sides of the leaf, but are usually more distinct on the upper surface. These spots are, as a rule, not

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sharply defined. In damp weather the spots are frequently studded with little tufts, which have a mealy appearance. The fruit is often infected by the rotten flowers falling upon it. It begins with a roundish brown spot upon one side which rapidly enlarges until the whole fruit becomes brown, shrunken and soft. Finally the fruit stalks are attacked and the fruit either falls on the ground or remains on the tree sometimes all winter. The fruit is often covered with the tuft as in the leaves, and in this state is highly infectious, as these spots contain the spores or reproductive bodies which propogate the fungus.

This fungus is technically known as *Monilia fructigena*, and consists of a mycelium or vegetative portion and the spores which correspond to the seeds of higher plants. The mycelium ramifies through the flowers, fruit, and leaves and produces the changes described above. The spores are borne in the tufts which are masses of threads or hyphæ pushed up through the epidermis. The spores are borne in chains, which may be branched, and are colorless and one celled. They are capable of retaining their vitality for a long time—two years at least. Hence, the utmost care should be used to destroy all material which have the spores.

Brown rot was very abundant on many of the cultivated plums in the vicinity of Ames, the Wolf being an exception. On a few varieties it was very destructive, causing a loss of one-third of the crop. There was a large rainfall the past season, which may, in part, account for the unusual abundance of this disease. It was not observed on the cherry and no report of its occurrence on peach was received.

Treatment.—Remove all diseased fruit and branches and burn them. Then rake up the rubbish beneath the trees and burn it. As it is probable that many spores remain clinging to the bark, the trees should be sprayed in the spring before the buds begin to expand, with a solution of iron sulphate, four lbs., to five or six gallons of water. Spray again when the flowers are opening, using sulphuret of potassium, one-half ounce of potassium to a gallon of water. A second application of this solution should be made about the time the fruit is forming. Repeating every two weeks from that on until the fruit begins to color.

ANTHRACNOSE OF RASPBERRY—*(Gloeosporium necator)*.

This disease was, in its early history, described as the "Raspberry Cane Rust." It attacks the fruit, petioles, leaves and stems. The fungus attacks both the fruiting and the non-fruiting canes. It appears at the base, usually, and progresses upward. The spots are purple at first, rapidly increase in size and as the disease developes, the center of each spot becomes grayish white. Usually surrounding each spot is a slightly raised dark purple border separating the healthy from the diseased tissues. In advanced stages of the disease the spots run togther and appear as irregular blotches which may encircle the cane. The canes are thus hindered in the performance of their function and as a result become sickly,—the leaves do not attain more than half their usual size and if the fruit is formed it is not fully developed and ripens prematurely or dries up. If the young canes are not killed the first year the continued action of the fungus prevents the formation of fruit the second year.

The leaves are attacked much in the same way as the canes. The petioles are attacked first and later on the frame work of the leaf shows whitish blisters.

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But very little is known of the development of this fungus. It consists of three parts, the mycelium composed of slender, colorless threads, the basidia consisting of slender stalks and the spores or reproductive bodies. The mycelium for the most part creeps through the bark and cambium tissues. In the center of the diseased spot, the ends of many of the creeping threads unite and form a dense tuft. This tuft under the microscope, has the appearance of short, slender, club shaped bodies arranged side by side. These are the basidia which finally rupture the epidermis and appear on the surface as a minute globule, as they are covered with a clear gelatinous substance. The spores are colorless, oval or oblong and are one celled. Each basidium bears but one spore.

The disease spreads rapidly in wet weather as the gelatinous glodules which contain the spores are dissolved and scattered about by the rain. Anthracnose of raspberry was noted on the Red raspberry in Ames. A great number of canes were affected, but it did not appear destructive. It has not been reported from other parts of the state this year.

To prevent anthracnose, the vines should be trimmed as openly as possible to admit the light and air. All old diseased canes should be removed. Sulphate of iron 21 lbs. to 5 gallons of water applied as a spray before the buds start in the spring. Later, if any disease appears use Bordeaux mixture.

POWDERY MILDEW OF THE CHERRY—*(Podosphæra oxycanthæ)*.

This fungus disease belongs to the Powdery Mildew family or the Erysipheæ. It was first named and described by De Candolle as occuring on the English Hawthorn. Since then it has been named differently by many writers who discovered it on different plants. This disease is quite generally distributed throughout the United States. Young nursery stock suffers most seriously upon its attacks. The following are the most important host plants upon which it has been found; Red Cherry *(Prunus cerasus)*, Wild Red and Yellow Plum *(P. Americana)*, Garden Plum *(P. domestica)*, Wild Red Cherry *(P. Pennsylvanica)*, Choke Cherry *(P. Virginia)*, Peach *(P. Persica)*, Apple *(Pynes Malus)*, Crab Apple *(Pyrus coronaria)*, Quince *(Cydonia)*, English Hawthorne *(Cratagus oxycantha)*, Shadbush *(Amelanchier Canadensis)*, Blueberry *(Vaccinium Myrtillus* and *V. uliginosa)*, Persimmon *(Diospyrus Virginiana)*.

This disease does not usually appear until July. It is first noticeable on the young leaves and shoots as roundish, white blotches, which have a radiated appearance. The blotches soon run together, often covering the whole leaf or shoot. It usually attacks one side of the leaf more than another, but it does not matter which side. The principal injury of this fungus is to the growing tips and young leaves. The most destructive form of the fungus bears but few or none of the perithecia or black fruiting bodies. The white felt, which creeps over the surface of the leaves, is the vegitative portion of the fungus or the mycelium. This mycelium is made up of white threads, which do not penetrate the host, but send down suckers, called haustoria, into the epidermal cells. As the development proceeds certain thick branches of the mycelium assume a vertical position. These are called the conidiopheres, or spore bearers, as they bear the conidia or summer spores. These conidia serve for the rapid spread of the fungus during the summer. Later in the season the spherical black bodies, called perithecia, are formed

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at the points where two filaments cross. This black body contains one sporecase or ascus which contains eight spores, called ascospores.

It is interesting to note that along with this mildew occurs another one which is parasitic upon it. The perithecia of the latter are not constant in size or shape, but are usually elliptical, and when pressed discharge from the apex a large number of small elliptical spores. This is a case of one parasitic fungus preying upon another parasitic fungus. It is found upon a large number of mildews, and undoubtedly does much to hold them in check. Conditions favorable to the development of this fungus are warm, dry weather. A light rain, giving the conidia or summer spores a chance to germinate, followed by a long, dry season, is probably the best time for the fungus to develop. It is a question whether the lack of rain favors the development or whether it is the weakened vitality of the plant during a dry season which causes the invasion of the fungus.

Powdery mildew was abundant around Ames this season. It was found on the cultivated cherry and a species of Crataegus, but on neither was it destructive. Reports were received from different parts of the state of its destructiveness to cultivated cherries. On one specimen received was found the fungus which is parasitic upon mildews—*Cicinnobolus cessatti*. This fungus was abundant upon the mildew around Ames and may have served as a check on its destructiveness.

On account of the manner of growth powdery mildews are easily reached by fungicides. Bordeaux mixture should be used from early July until the latter part of August. At least four applications of the spray should be given.

BLACK KNOT OF THE PLUM AND CHERRY—(*Plowrightia morbosa*).

This destructive disease has long been known in this country. Fifty years ago Downing said of it: "In some parts of the country it is a most troublesome disease, and has even destroyed the whole race of plum trees in neighborhoods where it has been suffered to take its course." Since then its destructiveness has been wide-spread, and an immense amount of damage has been done. The disease is characterized by the formation of hard, rough, black, wartlike excrescences on an enlarged and distorted outgrowth of bark. The first indication of the formation of a new knot is the swelling of the tissue which increases until the bark is ruptured. In this ruptured surface are exposed the threads or hyphae, which have a velvety appearance and an olive green color. On examining the velvety portion with a microscope great numbers of conida or summer spores are seen to be borne upon the upright hyphae. These spores drop off when mature and are carried by the wind and insect to other host plants, where, under favorable conditions, they germinate and thus scatter the disease from tree to tree.

When the production of summer spores or conidia ceases the velvety appearance disappears, the knot becomes hard and gradually changes to dark brown and finally to black. Later in the fall the surface of the knot is covered with pimples. The pimples are coverings of spore cases called perithecia. Inside these spore cases the winter spores are developed in colorless sacks called asci, each sac containing eight spores. A microscopic examination of a spore case in the fall reveals the fact that the spores are not formed at that time, and it had been found that they do not form until winter, becoming capable of germinating in February or March. The spore sacs break away from their attachment to the inner part of the spore cases

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and the spores escape and infect other trees. Both the summer and winter spores are born in great numbers and by reason of this the disease is highly infectious. Black knot is abundant around Ames upon wild cherries. It is also very destructive to a May-day tree upon the college campus. It was not found this season upon the cultivated plum and cherry. As the fungus is perennial the effect of one season would not be apparent.

In treating the disease we must take into consideration the fact that it lives over from year to year in the diseased parts. Badly diseased trees must be cut down and burned. Those not so badly diseased should have the diseased branches cut out and burned. The best time to do this is in the fall, as there are no leaves to hide the knots and because the winter spores have not developed. It must be remembered, however, that the winter spores develope in the cut branches the same as on the trees, therefore, they must be burned immediately. The summer spores must be taken care of in their season. The first appearance will be probably about the first of May. All branches affected must be cut out and burned. Various mixtures, such as turpentine and kerosine have been tried and have meet with some success in destroying the knots. In using these mixtures care must be taken to avoid killing the entire branch. The greatest trouble in stamping out the Black knot is the fact that it will be spread from other orchards and from wild plum and cherry trees. All in a community must work against it or the effort will fail. It is useless for one or two individuals to attempt to combat it.

PLUM POCKETS—(*Taphrina Pruni*).

For a long time this disease was thought to be due to insects. Later it was supposed to be caused by improper fertilization and still later it was held that abundance of moisture in the atmosphere, especially during the early stages in the development of the fruit, would produce the deformities. Although this disease was described as early as 1593 no explanation of the cause was given and it was not until 1861 that the real cause of the disease was discovered by a European mycologist who described it as *Exoascus Prunni*. Three years later it was thoroughly studied by De Bary and since then it has been studied by many workers who have verified De Bary's discoveries.

The pockets appear soon after the flowers have fallen, reach their full size and drop from the trees toward the middle or last of June. At first they are spherical in shape but as they grow older become more or less curved. The young pockets are nearly smooth and are distinguishable from healthy fruit by their pale yellow or reddish color. As they grow older the color changes to a gray, the surface appearing as though it were covered with a fine powder. The pockets turn dark brown and black and finally become dry and hard so that they rattle. In this condition they remain on the tree for two or three days and then fall to the ground.

The fungus frequently attacks the young leaves and branches as well as the fruit. Mr. Crozier found it abundant on the college farm at Ames in 1888, on the wild cherry (*Prunus serotina*) and several cultivated varieties of the wild plum (*Prunus chicasa*). He found it chiefly on the growing branches and leaflets which were greatly contorted and swollen in consequence. In June about the time of completion of the season's growth, the diseased branches turn gray and the diseased parts soon soften, then they dry up and die. Shoots which grow next year just below these dead points

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are very frequently affected by the disease. This disease is rarely widespread but usually attacks a tree here and there. One tree may bear nothing but pockets, while other trees of the same variety and grown under exactly the same conditions may be entirely free. As a rule a tree that has once borne a crop of pockets seldom recovers but contains disease in succeeding years. All plums are subject to attack by this fungus, but it is usually more abundant on the red and purple varieties. In this country it is found on the wild red plum (*Prunus Americana*), the beach plum (*P. maritima*), the dwarf cherry (*P. pumila*), the wild black cherry (*P. Serotina*) and the choke cherry (*P. Virginiana*).

Microscopically the fungus consists of the following parts: mycelium, asci and the spores. The mycelium is the vegetative part of the fungus. The spores are the reproductive part and the asci are the spore cases, Some of the hyphæ or threads of the mycelium break through the epidermis of the fruit and from these are developed the asci. The asci usually contain eight ascospores. When the spores are ripe they escape by rupturing the free end of the ascus. The spores germinate readily in water forming a daughter spore which in turn gives rise to another, and this process continues until the nourishment is exhausted. This takes place even if the mature spores are retained in the ascus so that when they escape there are a large number of spores. It is readily seen from this that the fungus is easily capable of propagating itself, as each pocket produces countless numbers of asci and each asci no less than eight ascospores and on germinating gives rise to several generations of daughter spores. However, no one has as yet succeeded in infecting healthy plums with the spores. As the mycelium has been in the twigs the spring before the disease appears it indicates that the fungus lives over winter in the tree. And the fact that the disease occurs on the same tree year after year bears this out. Plum pockets was not observed around Ames this season, but was reported from Ontario as quite destructive. In one orchard the disease was general throughout, not being confined to a few trees as is usually the case. The only treatment is to collect all the pockets and destroy them. It is well also to cut back the branches which contain the mycelium of the fungus.

PEAR BLIGHT (*Micrococcus amylovrous*).

Pear blight is now known to be a bacterial disease of which the cause is *Micrococcus amylovorus*. Pear blight. variously known as apple blight, fire blight and twig blight, is one of the most destructive diseases known to horticulturists. It has been known for a long time and many theories have been proposed to account for it. I shall not discuss these theories which are sufficiently well known, The first inkling of the true cause, was in 1878, when Professor Burrill announced to the Illinois State Horticultural Society the discovery of a bacterium which seemed to be connected with the disease. This he announced as a fact in 1880, but it remained for Professor Arthur to prove conclusively that the cause was a bacterial one. He did this by satisfying the four canons of Koch, viz.: first, to demonstrate the habitual presence of the organism of the disease in question; second, to find some medium outside the animal or plant in which the organism will live and multiply; third, to cultivate the organism in this medium for a sufficient number of generations to insure the complete elimination of other organisms which may

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have been introduced into the first cultures of the organism; fourth, to inoculate a healthy individual from the pure culture and produce the disease.

One of the most striking characteristics of this disease is the progressive blackening of the leaf and twig. The flowers and tender shoots are attacked first. From there points its progress downward until the largest branches are attacked and die. Usually the most rapidly growing succulent shoots are attacked first as the bark is more delicate and affords an easier entrance for the bacteria. If an affected shoot is examined slight ruptures in the bark will be found. These exude a gummy substance in minute droplets. Now if this exudate is examined under the microscope innumerable oval bodies will be found, either singly or in chains. These bodies are the bacteria which cause the trouble.

Pear blight was quite frequent on the succulent shoots of apple trees this season in Ames. It was not destructive. No reports were received from it in the state, but it has undoubtedly been present in a great number of orchards. No spray can be used in bacterial troubles. The only remedy is severe pruning. Cut out all the diseased twigs and branches. In order to be certain of getting all the diseased tissue, cut the branches six or ten inches below the apparent infection. As succulent growth is a favorable condition, water and nitrogenous manure may favor the disease by causing a rank growth

PLUM SPOT, (*Cladosporium carpophilum*).

For a number of years this fungus has been very destructive, although it has not been in this vicinity in recent years. It was observed this year but was not in sufficient quantity to be appreciable. According to Dr. Pammel, who observed it in the vicinity of Ames, the American type, (*Prunus Americana*) is affected the worst. The Wolf plum being a notable exception. Plum spot or scab appears in July on the half grown plums which are affected with a grayish or olive brown spots. These usually spread in a radical manner from the starting point. When the spots are numerous the fruit becomes shriveled, and when the plum is ripe a crack extends across it affording an entrance for plum rot. Plum scab is closely related to apple scab. It consists of a mycelium which creeps over the surface. In old decaying plums a dense stroma of short hypbae is formed. The spores which are either one or two celled, are borne either laterally or terminally on erect hyphae. In treating, Bordeaux mixture should be used. This should be applied about four times through the season, making the first application when the plums are well set. The mixture will be more effective if a little soap or syrup is added.

REPORT OF DELEGATE TO THE ILLINOIS STATE SOCIETY.

BY W. GREENE, DAVENPORT.

The sessions were held in the supreme court room in the capitol, at Springfield. The fruit was in an adjoining room from where the sessions were held. The exhibit, consisting entirely of apples, was a large and attractive one. The display was made on tables without plates, otherwise the arrangment was the same as is customary in such exhibits.

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The Illinois society is not so fortunate as the Iowa society in that it does not possess a permanent home in the state building. They were, however, promised one in the new agricultural building, at Champaign, if they would locate there, where the society would be in touch with the university and its department of horticulture, which proposition the society seemed inclined to accept. A comparison between the two societies will not be invideous and might be beneficial. The Illinois society is ten years the senior of the one in Iowa, in membership and attendance at the meetings they are about the same. The annual appropriation for the Illinois society is $4,000, that for Iowa is $2,500 and the publication of the report which costs about $2,300. The Illinois society publishes its own report, an issue of 5,000 volumes, of about 500 pages, costs $1,500.. The Iowa report contains about one-fourth more words than the Illinois volume. On a basis of economy the competitive system has the advantage, to say nothing of the promptness in the execution and delivery of the work. The state is divided into three districts with an auxiliary society in each, and seven experiment tations in the southern district and four in each of the other two. The Illinoi society expends about as much money annually on its experiment stations as the Iowa society does.

A number of very interesting papers were read during the meeting and the discussion which followed those treating entirely on topics where experiences differ, were quite animated at times. Mr. Aldrich's paper on "An experiment on pruning old trees," was one that touched a good many tender spots in the general practice and theory of orchard management. The paper treated on the renewing of an old orchard that had been fifteen to twenty years in blue grass sod. The varieties were Early Harvest, Early Pennock, Red Astrachan, Ben Davis, Winesap and a few other sorts. Some of these were productive, others were not. The fruit was small and not saleable. Many efforts were made to increase the size, quality and quantity of the fruit; by cultivation, spraying, fertilizing with artificial and stable manure and by pruning. Mr. Aldrich's experience seemed to upset a good many pet hobbies that many of us have toyed with, perhaps, more than occasionaly. The pruning he gave this orchard was a shearing back, the heading in of the entire top and not the cutting off of large branches. From two to three feet of the growth was cut off and a thinning out of the small branches where there were too many of them. It required an active man about two hours to trim each tree. The work was nearly all done with pruning-shears in the hand or on a pole. A number of different lengths were used, but a pole about six feet long was the one most used. The use of a step ladder was often required. The intention of the pruning was to sacrifice the crop of fruit and increase the growth of wood, but the result was, that many of the old trees bore from twenty to thirty bushels of fine apples to the tree. The cost of different methods of thinning the fruit was considered; by pruning, hand picking etc., and the exhausting effects of excessive flower production had on the tree was also discussed.

To sum up the experience of Mr. A. H. Aldrich, who lives in Neoga, Cumberland county, southeast of Springfield, it would be about as follows: After twelve years trial of a blue grass sod in an orchard, he would never permit it to enter again. He would not sow clover, nor raise a crop in a bearing orchard, except what would remain on the ground; he would sow beans late in the season.

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To cultivate, spray and prune, should be the watchwords and slogan of the orchardist. On the other hand experience points to orchards that have been neglected, so to speak, that have gone on living and bearing fruit, while those that were well cared for have died, "so there you are."

The next paper was by Mr. A. A. Hinkley, along the same line of thought; the care and management of orchards. The subject was "Leguminous fertilizers for orchards." As this topic was discussed almost entirely by men from the southern part of the state, the cow pea received much attention. After the experience of root-killing of a year ago, the discussion on cover crops was a "paramount issue." It was, however, coupled with the utilitarian idea of feed and pasture for stock. Cow peas and soy beans were most in evidence. In southern Illinois the cow pea may be sowed broad cast on freshly plowed ground in June or July. The Canada cow pea will mature a crop in time to sow the varieties they use, or the soy bean or hairy vetch. The method recommended for seeding was in drills thirty inches apart and then to give shallow cultivation until the vines covered the ground. The most profitable way to handle these crops was thought to be by pasturing with sheep or hogs, or making it into hay and as a cover crop. When used as a cover crop, it was recommended to roll down the vines when they would interfere with the gathering of a crop of fruit and then cultivate the ground in the spring with a disc harrow. One bushel of seed is sufficient for four to six acres of the pea. The varieties used, and making hay of them was discussed at length. The conclusion reached was that when properly cured it made excellent feed for stock as well as pasture when they were allowed to graze on it.

Mr. T. E. Goodrich, of Cobden, discussed the subject of originating blight resisting varieties of pears. He said that Sickel or De Anjau were less subject to it than Bartlett and Kieffer, and Garber than all three. That the new seedling, Koonce, was a move in the right direction.

William E. Praeger's paper on "Birds in Horticulture," was an exhaustive treatment of this subject, and I wish every man that owns a gun would secure the report and read it. After enumerating many of the birds which are common visitors to the fruit plantations, and giving an account in detail of their food habits, he paid this tribute to the light winged guests who spend the summer with us. "But I would be doing an injustice to my subject, were I to limit the beneficial influence of the birds to the field and garden. No common drudges are they, sullenly working for a daily wage, but they came brightly clad, and with joyous voices to their appointed task. With man alone they share that wonderful power of song, their speed and grace of movement fill us with admiring envy, the exquisite color and texture of their plumage are unequaled by created things; they appeal to our best aesthetic sense, and in their lives we see beings gifted with a higher intelligence, teaching us love, courage, constancy, maternal care, devotion to duty. There is not one of us but may learn a lesson from the birds."

One evening was given over to Prof. J. C. Blair for an illustrated lecture on "The Freeze of 1899." They. like many others, who live in the Mississippi valley, have had an experience in root-killing, but just what that experience will teach us is not yet definitely known.

The cutting back of trees was discussed, and the conclusion arrived at seemed to be that moderate pruning was an advantage to the trees, but the cutting back to stubs did not improve the condition. The injury was at the

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wrong end of the tree to do much good by cutting off the top; had the roots been all right the result would have been different.

Prof. J. T. Stinson, of Fayetteville, Ark., read a paper on "New Seedling Apples," grown in Arkansas. The varieties were given with the synonyms, Arkansaw and Mammoth Black Twig are one and the same. It is considered a shy bearer, especially while the trees are young. It was thought that the Arkansas Black would not prove to be of much value. Arkansas Belle seems quite similar to the Gano. The Beach is known as Lady Pippin, Richardson Red and Apple of Commerce. The Collins is known under several names of Champion. Etris is very much like the Gano. The Givens is growing in favor. As to Howard Sweet, it is not decided yet whether this apple is identical with the Lady Sweet or not. Oliver is also known as Senator. There is some complaint as to the growth of the tree of this variety. Regan and Black Ben Davis and Gano are thought to be the same.

Considerable time was taken up with a discussion on the Ben Davis and Gano apples. The conclusion seemed to be that the Ben Davis would produce more barrels an acre of large fruit, but the Gano was of higher color and better quality, and would give as many dollars an acre as the Ben Davis, because of the higher price received for the fruit.

Mr. Nelson, of Missouri, recommended for planting, in that state, the following list of apples: Gano, York Imperial, Minkler, Robinson Pippin and Maiden Blush. The Ingram and Lady Sweet were favorably spoken of. Much of this discussion would apply only to the southern part of this state.

Mr. H. L. Doan, of Jacksonville, read a paper on "Cultivation Esential to Fruit Growing," which we can fully endorse. His thought was to cultivate so as to keep the soil in good tilth all the time. That apple trees would come through a long, hot drouth in better condition, and not drop their fruit, as they do when in grass, if better cultivation was given. The tools principally used were the pulverizer and smoothing harrow.

I believe that thorough cultivation through the entire growing season, is the best method to persue. Mulches and cover crops may serve a purpose where cultivation is not practicable, but can never take the place of thorough cultivation for keeping the soil in the best possible condition for tree or plant growth.

The last two papers which I will mention were by ladies and were a presentation of the aesthetical and sentimental side of horticulture so much neglected in our society. One was by Anna Riehl, of Alton, and was filled with beautiful thoughts on the influence which nature, and a love for it, has in building up and broadening character by adding those amenities which flow only from communion with the pure and good as found in nature. The other paper was by Mrs. E. B. Freeman, of Princeton, on the arrangement of tree and shrubs and she emphasized the importance of adorning the home grounds with them for the beneficial influence they exert, not only on the immediate family, but on the whole community. I cannot refrain from quoting the last sentence. "If the man who makes two blades of grass grow where but one grew before is a benefactor, what shall he be called, who ornaments his home with the most beautiful productons of the vegetable world, adding not only to the health, comfort and happiness of his own household but to that of every beholder. He blesses the eye and cheers the heart of every passer-by, helps to temper the wind and storm and too scorch-

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ing rays of the sun, to increase the fertility of the soil, to conserve and make more effectual the dews and rainfall; he furnishes a shelter and a home for feathered songsters, showes his own appreciation and love of nature, teaches the same to his children, and fosters it in others, and by his axample and influence bids all to look through nature up to Natures' God."

Professor Forbes gave a talk on insects and fungus diseases and a paper on the working of the San Jose scale law in the state. The handling and packing of fruit for cold storage was considered at some length and papers were also read on vegetable gardening and small fruits for tne home, but the limits of this report will not allow mention of them here.

The members of the Illinois Society are earnest and indefatigable workers and their labors will result in much good to the state.

FRIDAY MORNING, DECEMBER 14, 1900.

BOARD MEETING.

At 9 o'clock President C. F. Gardner called the meeting to order. All of the directors were present except R. P. Speer. A number of the station keepers were in attendance.

Ex Governor F. D. Jackson presented the claims of the Pan-American Exposition to the members of the board.

The bill of C. L. Watrous was, on motion, ordered to be separated, and was then allowed. The bill of the secretary for extra expense was approved and ordered paid. The bills of the station keepers and the directors were then filed, audited and allowed. The board then adjourned.

The new board was immediately called to order by President M. J. Wragg. The members present were: C. G. Blodgett, William Langham, Silas Wilson, Abner Branson, W. O. Willard, A. L. Plummer, Ben Shontz, B. F. Ferris, P. F. Kinne, W. A. Burnap, Eugene Secor. Capt. R. P, Speer was absent on account of sickness.

The first business tranacted was the election of members of the supervising committee of the experiment stations. Mr. N. K. Fluke was elected to fill the vacancy caused by the resignation of Prof. John Craig, and C. F. Gardener was chosen to succeed himself in that office.

Mr. B. F. Ferris then moved that the resolution referred to the board to increase the annual appropriation to the auxiliary societies to $200 be taken up.

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On motion of W. A. Burnap the rules were suspended and an informal discussion was had as to the condition of the society's finances, at the conclusion of which formal business was resumed.

The rules were then taken up, and as read by the president were passed or amended, to meet the approval of the board. Rules 1 to 8 were passed without change. Rule 9 was amended to read as follows:

9. The experiment work of this society shall be in charge of a supervising committee of three to be elected by the board of directors. Each member of this committee shall serve three years. One shall be elected at each annual meeting, at which time vacancies in the committee shall be filled if any exist. The committee may annually elect its own chairman, who shall keep a full record of the work and expenditures of the committee, and shall report the same in writing to the board of directors at their annual meeting.

Rule 11 was amended to read as follows;

11. It shall be the duty of the supervising committee to make personal examination of the condition of the work at each station once in each year. They shall report their observations in their annual report.

Rules 10, 12, 13 and 14 were passed.

Rule 15 was amended to read:

15. That hereafter no paper or report shall occupy more than five pages of our annual volume, and the secretary is authorized to edit all reports and papers.

Rule 16 was amended by striking out $150 and inserting in place thereof $200.

Rules 17, 18, 19, 20, 21 and 22 were passed. Rule 18 was interpreted to mean, only states which touch the boundary of Iowa.

Rule 23 was amended to read; That the reports of the twelve directors of the state society be submitted to the secretary on or before the first day of the annual meeting.

Rules 24 and 25 were passed Then, on motion, all the rules as read and amended were adopted.

On motion, $150 was appropriated as a contingent fund for the office of the secretary, and $50 to purchase books for the library.

On motion, an appropriation of $500 was made for the Pan-American Exposition and placed in the hands of the executive committee on conditions that it be used only if, in their opinion, a creditable exhibit could be made for that sum; but no part of

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the money was to be used for other purposes than in collecting the exhibit.

On motion, $60 was appropriated to illustrate the report. An appropriation of $25 was made for an exhibit at the state fair.

Mr. C. G. Patten, of Charles City, was elected a delegate to the meeting of the American Pomological Society, and Mr. Eugene Secor, of Forest City, was chosen as the alternate delegate.

The salary of the secretary was fixed at $800, and that of the treasurer at $100 for the year 1901.

The board then adjourned.

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PROCEEDINGS

OF THE

SUMMER MEETING

HELD AT DES MOINES, AUGUST 30 AND 31, 1900.

The society met at 9 o'clock in the rooms at the capitol, but as most of the members present preferred to hold the session in a tent on the Fair Ground, on motions the society adjourned to meet there at 2 P. M.

At the hour named President Gardner called the meeting to order in the tent south of the Horticultural Hall; then read the following address.

PRESIDENT'S ADDRESS.

Gentlemen:

It is with pleasure that I meet the Horticulturists of this and adjoining states at the summer meeting of our society. We extend a hearty welcome to all who may attend our meeting and invite them to participate in our discussions. Make yourselves at home and call up such subjects as you would especially like to hear discussed by the prominent horticulturists who will be present and take part in our deliberations.

I have no doubt but that this summer meeting, held as it is, during our State Fair, will result in great good to every member of our organization who is so fortunate as to be present with us, and indirectly through those here, it will be a benefit to every one of the members of our organization.

We have before us, subject to our examination, an exhibit of fruits and plants gathered from all parts of the state which speaks for itself. It shows that the interest in horticulture among the people is not lagging, but is lively and full of energy. It is the object of this society, the purpose for which it was organized, to so control and direct this interest as shall bring the best results. We must take care of and develop as far as possible the fruits we already have and originate others peculiarly adapted to our soil and climate. This work of developing new varieties will be reported on by our experiment station keepers at our next annual meeting in December.

Our thanks are due Secretary Wesley Greene for the pains he has taken to so arrange matters as to give us the greatest amount of good to be obtained at a summer meeting.

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In conclusion let me say: I hope every one who attends this meeting will go home a wiser and a better man. Wiser in horticultural knowledge and better qualified to carry on the work by utilizing and holding fast to what we have got and adding thereto as they are developed, those new forms of plants and fruits nearer and nearer perfection, until our state ranks first in the fruit producing states of the union.

CAPT. R. P. SPEER then said: There is one thing this society ought to do, and that is, it should discourage the propagation and dissemination of so many varieties of the apple and plum. Many of these varieties are not desirable, and only confuse the purchaser in making a selection of the best sorts. There is a flood of summer and fall varieties, but good winter apples are scarce; these will always find a good market. There is a demand for good apples to eat. I have found ready sale for varieties like Sops of Wine and Williams' Favorite. We want to give more attention to this demand for apples that are good for eating out of hand.

PROF. J. L. BUDD: Said he endorsed all that Captain Speer had said in regard to the dissemination of fruits of a better quality, especially of the apple. There is a constantly increasing demand for good apples for dessert purposes. The Liveland Raspberry has high quality and should be better known. But wanted to call attention to the exhibit of fruit on the tables in the hall. The exhibit of Hybrid apples shown by Captain Speer was worthy of careful study. Many of these were seedlings of Duchess crossed with other varieties while Mr. Speer was at the station. They show in a marked degree the prepotency of some varieties in transmitting their peculiar characteristics. Some work was done at the college in crossing Osceola on Hibernal, and the resulting fruit showed the peculiarities of the Osceola in stem, color, size, and keeping quality of the fruit, but the leaf and habit of the tree followed more closely that of the Hibernal.

We want hardier apples for the south as well as the north, and I wish to add, that if nothing good has come from the Russian apples, the scattering of these trees over the country will, by natural crossing, give rise to a hardier race of apples.

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SOME DESIRABLE FLOWERS FOR THE LAWN.

BY L. H. PAMMEL, AMES.

It goes without saying that every yard should have some shrubs, the kind and number will vary with the size, location and locality. I am, of course, to confine my remarks to Iowa conditions. Right here let me say that we have a larger list to select from than is ordinarily supposed. Not only have we a large number of native plums well adapted for this purpose, but there are many exotics that are both hardy and beautiful.

Let me run over briefly a few of the native shrubs. Of all the shrubs and especially climbers I know of, nothing better than the everblooming *Lonicera sempervirens*, though not indigenous to this state, but of Eastern North America. It flowers early and keeps up through the entire season. It is perfectly hardy. I know of no native species which compares with it. The native *Lonicera glauca* blooms only a short period. The *Lonicera Sullivantii* is native to southwestern Wisconsin and southeastern Minnesota. This also blooms much longer than our small native honeysuckle. The southern Alleghany mountain *Lonicera flava* is not generally cultivated in this state, but it ought to prove hardy in southeastern Iowa, and where it can be grown is preferable to any of our other honeysuckles of that type. The Tartarian honeysuckle is extensively cultivated in many sections of this state and is perfectly hardy; the hard winter of 1898 and 1899 did not injure any of the plants so far as I know. It blooms profusely and continuously during its season in May.

The Golden Currant was commonly planted for ornamental purposes a decade ago, but is now seldom used, but it is a most desirable shrub, perfectly hardy everywhere in the state.

The shrubbery Cinquefoil (*Potentilla fructicosa*) is serviceable in small yards. It is a profuse bloomer, especially during wet years, the yellow flowers appearing for weeks. Specimens on the college grounds have been in flower since June. The species is native to Illinois, Minnesota, Wisconsin eastward and to the Rocky mountain country.

The Shrubby Saint Johnswort is indigenous to the eastern part of this state. The species bears yellow flowers and blooms over a somewhat extended period. Of the Staff-tree family mention should be made of the climbing Bitter-sweet (*Celastrus scandens*). This plant is indigenous throughout the northern Mississippi valley and eastern states. It is a twining shrub. The flowers are inconspicuous, but the orange colored pods and the brightly colored aril are highly ornamental in the autumn. The European climbing Bitter-sweet *Celastrus punctata* has been cultivated for some years here at Ames, and is not only hardy, but a very valuable species for rural walls, verandas and buildings. Another plant of the same order is the Burning bush or Wahoo—*Euonymous atropurpurea*. This is a tall, upright shrub, six to fifteen feet high, flowers rather inconspicuous and perfect. It is highly ornamental in autumn, because of the crimson fruit and scarlet aril which

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droops from long peduncles We have one other species of strawberry bush. The *Euonymous Americana*, which differs from the former species in that the pods are rough warty, with a crimson fruit and a scarlet aril.

Of the Buckthorn family some species of the genus *Ceanothus* commonly called the New Jersey Tea (*C. Americanus*) should be cultivated. It is indigenous throughout the Mississippi valley and eastward, is very hardy, produces pretty white flowers.

Of the vine family, too much praise cannot be given to the Virginia creeper (*Ampelopsis quinquefolia*), which of course is hardy throughout the state, being native of eastern North America and extending into the Rocky mountains. There seems to be two well defined forms, one with tendrils like the ordinary grape and the other with tendrils that are disc like. Sometimes, too, it climbs by means of its little rootlets. The Rocky mountain form is more desirable than our eastern type. The leaves are glossy and very bright green. The Virginia creeper (*Ampelopsis quinquefolia*) is quite as popular in Europe as it is in this country, and it well deserves to be, for no other creeper grows so profusely and is as hardy as this species.

Of the Cashew family, I would especially recommend the cultivation of the Staghorn Sumach (*Rhus typhina*). Though sometimes becoming a tree it can be used to good advantage in a large lawn. Its bold, rugged appearance gives it a strong contrast in an open lawn. I would also recommend the planting of the Lobadium (*Rhus Canadensis*). This shrub, or straggling bush, from three to seven feet high, is indigenous in the eastern part of this state, occurring as far west as Cedar Rapids. It is especially suited for rocky, gravelly and exposed places. The crushed leaves are pleasantly fragrant.

Of the order Leguminoseae there are many native species which are adapted to cultivation. From among these I would mention the Lead Plant (*Amorpha canescens*), with its flowers violet and whitened hairy leaves. The False Indigo (or *Amorpha fruticosa*) is more extensively cultivated. It is a taller shrub and the purple flowers are conspicuous and pretty.

The Judas tree (*Cercis Canadensis*) may be used for large lawns. In this state it frequently attains only the height of a shrub, and therefore may be included in this list.

I desire to call attention to one other shrub, namely, the Trumpet creeper (*Tecoma radicans*). This is indigenous to southeastern Iowa, and is hardy as far north as Marshalltown, Ames and Des Moines, and should find more extended use.

Quite a large number of valuable shrubs are found in the rose family, and many of these are very desirable even where the lawn is small. In a paper of this kind, of course, only a very few can be mentioned, and it seems desirable that every lawn should at least have a few roses, and there is now quite a list to select from. Our native species, *Rosa blanda* var. *Arkansana*, though pretty while it lasts, is hardly desirable, because it does not bloom long enough. The common prairie or climbing wild rose, which sometimes goes by the name of Prairie Queen, the *Rosa setigera*, a native of the rich grounds of the southern states. but extending as far north as northern Missouri, is a highly desirable shrub for the lawn, especially for verandas. It is quite hardy without protection throughout the southern portion of the state, and in the northern portion is hardy when protected somewhat. Nor should

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I omit to mention in this connection the European sweetbrier, *Rosa rubiginosa*, which has become naturalized here and there in the state, It is not not uncommon, for instance, in the eastern section, as far north as LaCrosse, along the Mississippi, and is more or less widely cultivated in many parts of the state. It is especially desirable because of the sweet-scented leaves. Of the other cultivated roses your attention should be directed especially to the Japanese rose or the *Rosa rugosa*, which is coming more and more into esteem every year. In fact, on account of its fine foliage and its long season of bloom, it is one of the most desirable of all of our roses. Some of the brambles are especially desirable for ornamental purposes. In this connection I want to call especial attention to the eastern purple-flowering raspberry. This is perfectly hardy everywhere in the state, and in a shady nook it should occupy a prominent place. The Salmon Berry or *Rosa Nutkanus*, is a fine plant for similar situations. This is likewise hardy in every part of the state, and should be cultivated more extensively than it is.

The Shrubby Cinquefoil or five-finger (*Potentilla fruticosa*), native in the wet grounds northward and eastward is especially common in the Rocky Mountain region, is perfectly hardy and adapted to the lawns in this state. The plant grows from two to four feet high, and bears numerous small leaflets and yellow flowers. It is a constant bloomer, that is, beginning to flower in May or early June, and continuing through until frost, and hence is one of the most desirable shrubs. The nine-bark, *Physocarpus opulifolia*, native to the wooded portions of the state, especially eastward; is very desirable. It grows rapidly, and the fruit is always pleasant to look at. The flowering season is rather short. During recent years the pearl bush, *Exochorda grandiflora*, native to China, has been widely recommended as an ornamental shrub. The large white flowers are conspicuous, and are pleasing during their flowering period. It is a desirable plant, and is hardy.

The spireas or meadow sweet are well known to most amateurs, because they are so extensively cultivated. Several of the species are adapted to our conditions, and should find a wider place in the list of shrubs for the lawn. Of the species generally adapted to our conditions the *Spirea Thunbergii* of Japan, which is a dwarf and compact shrub with slender and somewhat drooping branches, comes very early in the season. *Spiraea trilobata* native to Siberia, is a beautiful spreading smooth bush with crenately-cut, three-lobed leaves. One of the improved forms of this is the *Spiraea Van Houttei*. The *Spiraea salicifolia* which is our native meadow sweet of our northern eastern states, extends as far west as central Iowa. This is a desirable shrub, and is frequently cultivated. The northwestern *Spiraea Douglasii* has been cultivated to a considerable extent in Iowa, and is hardy and pretty.

The service berry or shad bush (*Amelanchier*) is better known because of its valuable fruit, nevertheless, the dwarf *Amelanchier alnifolia* is a desirable shrub, besides producing a large amount of fine fruit. The shrub grows much more symmetrical than the common shad bush *Amelanchier Canadensis*, and hence is very desirable on the lawn.

Nor should I omit in a large lawn the Japanese Pyrus, *Pyrus Japonica*, which is cultivated to a considerable extent in the southern part of the state, because of its showy flowers. The species is scarcely hardy north of the central portion of the state.

Nor should I omit from the list for the southern portion of the state the Carolina allspice or sweet-scented shrub, *Calycanthus laevigatus*.

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PROFITS IN EARLY FRUITS.

BY J. C. FERRIS, HAMPTON.

If the early bird catches the worm, the early worm feeds the bird. The first in season of its kind is always desired. While all who have desirable fruits to offer may expect a market, only those first in the market can expect the very best prices. From the Michel's Early strawberry to the Northwestern Greening apple, the very earliest competes with the very latest.

In strawberries the very earliest brings the best price per quart; in raspberries, currants and gooseberries the same rule holds good. I have sold Janesville grapes for forty cents per basket, and found it difficult to market the much better Worden at twenty-five cents.

In this year of our Lord 1900 I find that the cherry and plum brought fifty cents a peck on the fifth day of August, while better plums were sold on August 20th to September 10th at twenty-five to thirty-five cents per peck.

But all these prices are side issues compared with the "king of fruits," the apple. Apples, their name is legion, yet here again we find the first fruits carrying off the premiums and the profits. Even at the north we begin to eat the Yellow Transparent from July 10th to 20th, and it is always worth twenty-five cents at Hampton. It takes the market where the winter apples leave it, and the demand is only limited by the number of apple eaters within reach.

Given an elevated site and suitable soil, ten acres of Yellow Transparent apple trees would be a very profitable orchard near Des Moines or any other city.

FRUIT GROWING IN NORTHWESTERN IOWA.

BY P. F. KINNE, STORM LAKE.

After the apathy caused by last years discouraging and destructive effects it is a pleasure to note the increased confidence of the people in the things that be. A goodly crop before their eyes is a more potent argument than all the wind and chin music of the agent or grower. Seeing is believing and with the fruit before his eyes the customary quiz of the eastern or southern visitors of, "can you raise fruit in northwestern Iowa" is paralized before utterance and his expression is rather one of surprise and pleasure, that such fruit can be raised in this section. More fruit has been shipped west and north from the northwestern part of the state this season than the total of all previous years. The constant inquiry for trees, plants and method of planting indicate a healthy and hopeful tone for the fruit industry in all lines. The injury to old plantations from the fall and winter of 1893 is becoming

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more pronounced and next spring will show them rendering up their final accounts. Tender and half hardy varieties will be pretty well weeded out. So much damage was done the small fruit industry in '98 that the crops this season was light, but moderately favorable planting conditions followed by seasonable growing weather has placed the present outlook for the small fruit industry in a condition above par, and this puts us in a very hopeful position for the crop of 1901. The crop of early summer apples has been good, but the high temperature of the past two weeks has had the effect of prematurely ripening the fall apples so that now the market is glutted with apples that should not have been on the market for at least two wees. This will make the shortage in winter varieties much more marked than it should be. The need of the northwest is hardy winter varieties. We ask no odds of our southern friends on summer and early fall apples. Growers and experimenters should leave no stone unturned to find for the northwest winter varieties that shall be hardy and fruitful, and it will be a glad day indeed when we shall be able to cry "Eureka" and such ought to be the name of the apple that fills the needs of the great Northwest. That ultimately we shall find it I have no doubt, till we do we can but do as the spider did long since, try, try again. Our progress along the lines of experimental horticulture must of a necessity be slow, unlike electric and mechanical experiments, we cannot at once demonstrate their value but must await the more or less slow process of natures' machinery, and years must elapse before we can say, I have it, but our faith is abiding and with necessity for a mainspring we may well hope for the fruition and realization of our hopes.

CARE OF ORCHARDS BETWEEN FIVE AND TWENTY-FIVE YEARS OF AGE.

BY A. BRANSON, NEW SHARON.

We will take it for granted that our orchard has been planted with No. 1 two or three year old trees and has had the best of care and cultivation in the first five years. If so, some of the early varieties will have commenced to produce specimens, at least, I well remember my first planting of twenty-one Wealthy trees in one row; four years after planting eleven of these fruited, and the one that was the most prolific produced forty-three apples, and the one with the least number of apples was three.

Ben Davis, Black Annette, and some other of the early bearing varieties have often fruited on six year old trees.

If the orchard has had the best of care, as stated above, we would now seed to clover, but if not properly cared for we would continue the cultivation one or two years longer.

We would sow clover in early spring with oats or barley, or a mixture of these two grains, and we are likely to get a good stand of clover, but we would not seed around the trees nearer than four or five feet, but would mulch this space with coarse straw or give a good hand hoeing about every week during the forepart of the season. Some growers on rich land around Oska-

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loose use coal slack to good effect. This holds the moisture, keeps down weeds and also keeps the ground cool and is effective for a number of years.

If the orchard is very rich, we would mow the first crop of clover, leaving the second on the ground for a cover crop. In three to five years after clover has been sown, the blue grass will come in; if so, we would plow between the rows as near to the trees as can be done without damage to them and plant a row or two of pumpkins; give these fair cultivation and they will soon cover the ground and keep the weeds down completely. We would continue this cultivation for two or three years and again seed to clover.

With proper care in pruning for the first five years there will be little need for pruning now, except to cut out water sprouts and cross limbs. This can generally be done with a chisel and pocket knife.

The apple tree borer is one of the greatest pests to the apple tree. When once in the tree there is no remedy but to cut him out with a knife, or to kill him with a pointed wire, but the trunk of the tree may be painted or washed with a solution that will keep the bark so smooth that the eggs are not laid or it will destroy them when on the tree. One of the best remedies is soap-suds applied to the trunk of the tree from last of May to last of June, every ten days or two weeks. We would add to a gallon of soap-suds two ounces of sulphur and about a teaspoonfull of carbolic acid. Several farmers with fine orchards a few miles from where I live, claim to keep out the bores by planting Multiplying Winter onions around the trunks of their trees. These grow year after year without care.

Spraying we consider an important part in the work of caring for the orchard. When the orchard comes into full fruiting, spraying must be continued year after year in order to hold the fruit and get perfect specimens from all parts of the tree. Those who have tested it most and longest, say that the best results begin to show after several years of systematic work.

The time has come, in my opinion, that spraying in orchard culture is one of the most important factors in fruit growing in this country, as the greatest loss is from insect pests and fungus diseases.

TOP-WORKING NOTES.

BY W. M. BOMBERGER, HARLAN.

Points given are for those who have to do the work in a crowded time in the rush of spring. But in the apple it is possible, by the method pursued, to work them from time bark slips on crabs, just as the leaves get well started, until, if the growing season is good, and that can be encouraged by cultivating the stocks and often spading around the trees that are worked continuously until June 25th. I advise top working by budding. It is easiest, no grafts to be blown out, no wax to handle and get into and keep in condition, and the buds can be set over a longer period of time with success.

In the spring, before the ground warms up, you can, if bud sticks of grafting cions have not been gathered, get them off trees on limbs that have short mature growths, that are not water growths, and have lots of starch deposits in them, that shows itself by a gritty texture when cutting with a knife. Such

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a class of cions can be gathered, and they can be taken at any time off trees from grounds where one is visiting, or can be sent, with few cents for postage, from any distant point. In this way many things can be gathered and gotten ready for test and trial. Another good way to get at the proper conclusions, and to know quickest the behavior of new fruits that are high priced, is to buy a tree only of such and cut off all the last season's growth and place it with these cions for bud sticks, and then top-work some tree in the same class and get a full top of the new sort the same summer that you plant the tree, and if a vigorous tree, set three to five years, is rightly topworked a new growth of from eighteen inches to four feet of new growth can be secured of this new sort, and often the fruit can be obtained the second season, and some opinion of its merits formed.

Care of dormant bud sticks is best as follows. We formerly kept them in ice, but this is not necessary. Dig a hole three or four feet on north side of building or dense evergreen grove, and place a box in it without a bottom and a dirt floor; fasten a few cross sticks in this box four inches from the ground and place the bud sticks in the box on the cross sticks; place a tight fitting cover over the box and cover with a mulch, and the buds will keep there as long as the stocks have loose bark and the sap is in condition. The plum and cherry buds will not keep so late, but as late as they can be used. Have kept apple buds until July in condition to set. Another way to keep the stocks is to wrap them in oiled paper and bury in soil in such a location.

Early starting and leafing sorts of apples and crabs can be budded just as soon as the bark can be raised with a knife, some years last of April and 1st to 5th of May.

If you have not had experience in budding at all get a copy of Bailey's Nursery Book and go by the directions and illustrations there given. Work on cottonwood and willow sprouts first quite a while, and go mechanically through the operation until some degree of proficiency is attained. Do not go to any unnecessary expenses, as any common, thin bladed knife and soft No. 18 knitting cotton will do, if you have no raffia, which is excellent, that can be gotten from any seed store or nursery at a few cents per pound.

The budding of cherry and plum needs to be done just as early as you can set them, and the bark will slip on this class of trees. If you have many wild plum sprouts, or Miner sprouts on own roots, you can, in one season, set buds and start the growths in these buds so as to make a complete plum orchard of tested and commercial varieties in one or two seasons. Miner sprouts, we have found after years of trial, are about as good as any stock to top-graft plums of the native class. It is sturdy and a stronger grower and gives nourishment sufficient for the slower growers as De Soto and Hammer, and makes a splendid tree. I have found that the Japs work quite well on it, but the bark lacing must be kept cut lengthwise at the union of varieties.

Prefer budding to setting the graft as it is possible over a much longer season and if one's duties and work does not admit of doing it justas is seasonable to graft one can set buds just when they have time, covering several weeks on apple, and two or three on stone fruits.

It is possible to set buds on one year old shoots, or two year shoots on some varieties on older growths. Old trees can be cut back in limb and shoots started and these budded. But we like best to only top-graft trees that

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have been set three, four or five years. Think it best to not try to change a whole top at a single season and best to top-graft two or three of the central limbs. Then start these growths vigorously. They will on getting a good start lead in growth, as a rule over the whole of the rest of the tree, and act as a parasite, as it were, and exclusively absorb all growing energy. Yearly, if the top develops well, the stock can be slowly changed into exclusive support of the top grafts and the limbs of the stock gradually removed.

I think that it is best to have mixed tops, the more I experiment the more I think it advisable to leave some limbs of the stocks to mingle with the top grafts as the pollination is a good thing to start with. As for instance the Winesap is a poor pollen bearer and if it is top-grafted on a crab that is harmonious as the Virginia the bloom of the crab will be a great advantage. This is so also of Jonathan that is not a good pollen producer or has deficient bloom so frequently. In fact this is the case with most high grade apples as Grimes, Jonathan, Benoni, but the Grimes is fairly good.

As to harmony of varieties on stocks, that is a large question and one in itself for investigation and we cannot give anything conclusive. It is a question of soils also, as stocks doing well top-worked on some soils will not on others.

On my particular soil the Haas will do excellently for Jonathan; English Golden Russett for Grimes; Virginia Crab for Stark. This is proven now from experiments to date, we think that the Virginia is good stock for Grimes, Winesap, Black Twig; rather think it will be good for Jonathan, but we have some question on that point yet and must await for further test. In this section, or in Harrison county, we have had extensive experiments with the Tetofsky as a stock, and it seems to be congenial to a large number of varieties.

After setting buds cut limbs off at once three inches above the bud set; rub off buds of stock on limb above the bud set, and after it gets well started throw the energy into each bud as fast as possible by denuding gradually the new shoots that start on that limb to get the buds growing, one to three visits after the bud is set will be all that is necessary. The following season cut the stub off above the bud set, at a proper time for pruning, cover the wound with wax, and heal it over the same season. If the growth is started early this can be done the same season if the stock is growing vigorously.

This is possible in very thrifty growing young trees in nursery row, and the top-working as a part of nursery work can be made to a large advantage to planters, but such work should be done under contract and on order. Two active workers and budders can top-bud and work over from three to four hundred trees a day.

The tying of the buds must be more secure than for working stocks at the ground since the winds untie the strings and whip them open, and three slips of the string must be made where one is only necessary when working at the ground. Best always bud in limb three to six inches from the fork of the stock.

I would urge a little interest in this work as it is a quick, easy, handy, and nice way to work over many worthless trees, correct mistakes and get varieties of fruits by dozens and hundreds on a place very satisfactorily, to test and get to results from new things in one or two years, and to keep track of introductions and to weed them out more quickly and give out

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quickly reliable and intelligent reports on seedlings and fruits under home test.

J. S. TRIGG: The Brier Sweet makes a good stock for the Fameuse:

R. P. SPEER: Some thirty years ago I planted an orchard of fouteen acres, with apples, the trees done well for a few years, but in fifteen years I had lost nearly all of them. Nine-tenths of the trees died from sun-scald, or other injuries. The life of a tender variety can be prolonged by top-working it on a hardy stock if it is weak in the body and crotches and liable to sun-scald. In top-working we should select a stock congenial to the variety that is to be worked on it. In the nursery row the uneven growth of the trees is largely due to the seedling stocks on which they are grafted. I have tried many kinds of the hardiest of our apple trees for stocks. The Hyslop and Transendent crabs do not make good stock on which to work other varieties; some of these have stood ten years and not made any growth. The Duchess is not a good stock. The Gros Pomier fails because its root system is too near the surface for dry location, and the tree fails for want of moisture, and when the winters are severe is liable to root injury. The Whitney makes a good stock for some varieties. The Grimes Golden worked on the Plumb's Cider does not drop its fruit as much as when grown on its own roots. The Virginia crab makes a good stock for many varieties. The Big Estray makes the best stock of all the varieties that I have tried, and the Virginia crab the next best to it.

C. G. PATTEN: I do not think we have any best stock. The Virginia crab is a good stock in the eastern part of the state, so is the Brier Sweet, but in the northwest it fails, and the Virginia crab will fail there also, for the same cause. With me the Brier Sweet is very hardy. It is hardier than the Whitney. It is from the red crab; its seedlings are very hardy. I think we should grow seedlings of it for nursery stocks.

PROF. J. L. BUDD: The Big Estray spoken of by Captain Speer was sent out from the college under the name of Vilna Antonovka, only a few of these trees were disseminated.

PROF. JOHN CRAIG: As Captain Speer has brought this apple to the notice of the society, I move that the Big Estray be named by the society, and called the Speer.

The motion passed unanimously.

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ORCHARD COVER CROPS.

BY PROF. JOHN CRAIG, AMES.

The cover crop idea is a comparatively new one. The term is essentually modern. The practice is one which has grown out of changed soil conditions in the older parts of the country. We use the term "cover crop" to designate a system of cultivation which calls for the sowing on orchard soils of a crop about mid-season. This is at the time when the orchard crop proper, whether it be apple, cherry, plum or peach, should have practically completed its growth and have begun the process of ripening the wood and nearly completed that of maturing the fruit.

The term (see Cyclopedia of American Horticulture, page 388) is less than ten years old, having been first applied in this connection by Bailey in bulletin 61, Cornel, New York Experiment Station. So far as we know this is the first use of the term, but the practice is much older. The study of the evolution of the cover crop idea is very interesting. It is thus expressed by the writer in the article referred to above:

"In the early days of orcharding in this country, the soil rich in humus and undepleted of its natural resources, gave satisfactory crops of fruit with the trees growing in sod. As time went on the vigor of the trees waned and this was stimulated by various means, principally, however, by breaking up the sod, adding barnyard manure to the soil and giving thorough cultivation throughout the season. This plan gave unsatisfactory results in many instances, notably in the north, as it appeared to prevent the trees ripening their wood sufficiently to enable them to endure the winters without frost injury to the tips of the branches. Root killing was also noted as being occasionally severe on soils uncovered with vegetation during the winter. About this time the value of the pea members of the pea and bean tribe as enrichers of the soil became recognized more fully than formerly, through the discovery of the nitrogen collecting agents housed in the nodules borne by the roots of these legumes." This assisted in drawing attention to the many-sided beneficial effects of the cover crop. The term "cover crop" then is an expression which has grown to mean much in connection with the development of newer and better horticultural practices. It realizes the need of adding fertility to soils cropped by fruit trees, and it suggests that humus is an essential part of all soil's fertility. It in fact, admits the necessity of treating orchard soils as other lands are treated, namely, with liberal amounts of the essential fertilizers. The cover crop then, in short, assists the ripening process of the tree. which is essential in northern regions to the safe wintering of the tree. It improves the physical condition of the soil by the penetrating action of its roots. It adds to the fertility of the soil, the amount and quantity depending, very considerably, upon the crop used. It retards the penetrating power of the frost and its injurious action upon the roots of the trees.

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Orchard Parctices in Different Parts of the Country. The essentials of orchard practice in different parts of the United States vary more or less with the locality. There are some general principles which should be used as guide posts wherever a grower is situated. The first of these is the principle that orchard trees must be fed as liberally and as consistantly as any other farm crop. By the use of the cover crop this object is obtained in part. Potential fertility and periodic fertilizing is required whether the grower is cultivating pine apples in Florida or American plums in Dakota; but the Dakota grower uses his cover crop not only for the purpose of keeping up the fertility of the soil but also for the purpose of protecting the roots of the trees from frost injury. This then illustrates the different objects that a fruit grower may have in mind and the different ends which he may attain in using the cover crop in the orchard. Experience and observation have shown that fruit of fine size and good quality may be profitably grown upon the poorest soils provided the trees which are planted there are treated as a sufficient crop of themselves and are not asked to compete during the growing period with other crops, upon the same area. Georgia growers have shown us that magnificent crops of peaches can be, and are, grown upon almost pure sand, but they have also emphasized the fact that satisfactory results can only be attained by intelligent systems of culture. Orchardists in irrigated regions are beginning to understand that water and chemical fertilizers combined are not sufficient to produce long-lifed, healthy and productive trees. Their experience has emphasized the fact that the physical properties of the soil must be as carefully studied as the chemical contents are catered to.

Classes of Cover Crops.—There are practically two classes of plants which the orchardist may use for the purpose of securing a cover crop. These are the Nitrogenous class on the one hand and the Non-nitrogenous class on the other. The difference between these two is marked by the power of the nitrogenous class to appropriate, as explained in a former paragraph, the free nitrogen of the air and store it up in their tissues in such a way that it is more or less readily available to the successive crop. Prominent among plants which have this property are the clovers, the peas and the beans. These are the farmers' friends, the nitrogen collectors. It is a good omen and portends well for the prosperity of a country that the area of clover is increasing year by year the country over.

Among the Non-nitrogenous plants used as cover crops are some of the grasses, the cereals and some members of the mustard family, such as rape, turnips. Rye is a favorite among peach growers on sandy ground and in poor land, for the reason that a good stand is easily secured; that it grows vigorously, is not easly killed by frost and produces a large amount of vegetation. Buckwheat is much used by nurserymen and fruit growers for the reason that it germinates readily and grows so vigorously as to keep down the weeds, leaves the soil in a good physical condition and is with all, not an exhausting crop. As a winter protection however, it is of little value.

Nitrogenous Class.—Best plants to use. The best plants of either of these classes will depend some what on the locality in which they are to be used. In other words they will not succeed in all places equally well. Crimson clover which is an annual in the south will, usually, if sown from the first to the middle of August in peach growing localities, make sufficient growth to

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afford a good cover to the ground, will winter safely and will continue growth, the following spring producing flowers and seed about mid summer. While this plant is entirely satisfactory in peach and grape growing sections, it is unrelaible in apple regions. Frequently it fails to winter. Mammouth red clover is a strong growing plant and under favorable conditions will, if sown at the rate of 12 to 16 pounds per acre produces a satisfactory cover. But this often fails on the black prairie soils of the Mississippi Valley States, in young orchards where the plants are entirely unscreened from the sun.

In the Lake region of the east, Mammouth red clover gives good results. In the Atlantic States Crimson clover and Cow peas are the favorites. A plant which has been somewhat recently introduced by the Department of Agriculture at Washington and which has developed decided features of usefulness for orchardists in the Mississippi Valley, is the Hairy vetch, *Vicia villosa*. The seed is considerably larger than that of the clover and germinated in mid summer with greater surity of making successful growth. On the experiment station grounds at Ames the plants has given excellent satisfaction for the past two years. In 1899 a crop sown August 1st produced an exceedingly thick and heavy mat of vegetation which completely screened and covered the ground before the arrival of cold weather. Investigations which were instituted for the purpose of ascertaining the depth to which the frost penetrated in soil covered by vetch, by clover, by blue grass sod and a soil entirely uncovered showed conditions favorable in a marked degree which would be attributed to the influence of vetch. The frost on the vetch covered ground penetrated to a depth of 15 inches, on the heavy blue grass sod to the depth of 14 inches, on ground covered by cow peas to a depth of 21 inches while on bare ground it penetrated to a depth of 22 inches. These figures are the results of a number of tests and may be accepted as being entirely reliable. Hairy Vetch has a large field of usefulness before it in the prairie states. One of the difficulties will be that of securing the seed in commercial quantities. Cow peas and soy beans on account of their strong viability and exceedingly rapid growth have also special features of usefulness. Their weak points in the north lie in the fact that the first frost causes the leaves to fall off and we have remaining only the bare stems which have little protective power in themselves and only in a small way assist in catching and holding the snow.

Sowing the Cover Crop.—The cause of failure of cover crops may often be traced to faulty preparation of the soil. If the cultivation of the orchard soil has been thorough throughout the season, it should be in the very best condition about mid season for the reception of the cover crop seed.

Clover is a plant which should be treated with equal respect in this connection. Unless the seed bed is in a fine state of tilth, unsatisfactory germination may be expected. It is also a good plan to follow with the roller after sowing the seed. Important differences may be noted on areas which the roller has been applied as compared with other areas unrolled. The compressing of the seed, particularly when the soil is dry is a very important operation. This result the roller affects. When large seeds such as soy beans, cow peas and vetch are used, it is less important to attend to this part of the work but whenever the soil is dry and farmer will make no mistake in using the roller.

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WINTER PROTECTION FOR TREES.

BY B. SHONTZ, CORRECTIONVILLE.

The subject assigned for me to discuss before the society is a very difficult problem to solve. In Iowa, winter protection is necessary for all horticultural plants, but how to get the right thing for each plant or tree is the trouble; and, owing to the fact that it takes several years to develop the tree, and that its roots are in a very difficult place for investigation, this part of horticultural work requires the most careful consideration.

Now in my section of the state the character and condition of the soil must be taken into consideration. In an ordinary year clover is the best protection yet discovered for trees, but as to grape vines I have never tried it. In northwestern Iowa for the past five or six years the moisture from rain has penetrated at no time more than one to two feet deep. When digging deeper than this, I invariably found it to be dry. Now vines or trees planted with the soil in this condition could not send their roots "down" after moisture on account of the dry earth below. Trees and vines must have moisture in order to thrive and grow. To get moisure all plants had to send their roots along just under the surface of the ground, for there only, could they secure the best advantage from the regular summer rainfall.

During the last few years the growing seasons have been notably dry, and thus the whole root system of a tree, grown in this drouth period, has been formed along just under the surface of the ground. Now when we get a winter with scarcely any snow to protect and give moisture to these surface rooted trees, it is easily seen that they are in a precarious and exposed condition. Owing to lack of moisture our trees must "dry out" more than they "freeze out."

I believe that the great losses, especially in northwestern Iowa, have been caused, not so much by the "cold" but by the "dry" condition of the soil. Under such conditions I do not believe that we can furnish, or supply any protection, that will save the trees. They actually starve to death from lack of moisture. With the root system along the surface—and no moisture below, neither any on top of the soil—it will not take much cold to kill a fruit tree. Yet, under all conditions of the soil, and for all practical uses, I believe that clover is the best mulch that we can get.

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REPORT OF CO-OPERATIVE EXPERIMENTS BETWEEN THE STATE HORTICULTURAL SOCIETY AND DEPARTMENT OF HORTICULTURE, IOWA AGRICULTURAL COLLEGE, SEASON OF 1900.

BY JOHN CRAIG, AMES.

Plant Breeding.—The seed product of last year's hybridizing was, aftestratifying, planted this spring in especially prepared seed beds. The crop or young plants has been disappointingly small, although conditions for germif nation and growth were unusually favorable. This small return may be in part attributed to infertile hybrid seeds and partially to the slow germination. The varieties are carefully labeled and instructions have been given to retain the beds so that plants slow in germinating may be saved.

Work in 1900.—Our experiments this year were marked successes in some places and pronounced failures in others.

Apples.—These were hybridized at Des Moines, Knoxville, Glenwood, Ames and Charles City.

Spring frost destroyed most of the pollinated blossoms at Charles City, and a considerable percentage at Des Moines. Very gratifying success followed the work at Ames, Glenwood and Knoxville. Among interesting and promising combinations effected may be mentioned Ben Davis, Newton Pipin and many combinations of improved form of native crab with high flavored apples of the east.

Plums.—A large number of blossoms of improved types of native plums were pollinated with such well known commercial varieties as the Burbank, Ogon, Prune d' Agen and Glass seedling. Unfortunately a heavy spring frost visited the ground of Mr. H. A. Terry when the work was done, and destroyed it completely.

Pears.—The most pronounced success of the season in this matter of hybridizing was secured with the pears, on the ground of Mr. B. A. Mathews, of Knoxville. A special effort was made to secure a large number of hybrids between hardy pears and others of good quality and blight free. Birkett, as the female parent, was employed. It is gratifying to state that a large number of fruits have been obtained which are pollinated with such high flavored varieties as the Howell, Seckel, Anjou and Bartlett.

On the whole we have made substantial progress in this important work. I trust that the society will push it forward each year in the confident hope that progress and success are certain to crown its efforts.

Spraying.—Owing to press of college duties at spraying time last spring, the writer was unable to personally superintend spraying experiments outside of the college grounds at Ames. We have found that Bordeaux mixture properly applied not only prevents fungous diseases, but it is an active deterrant of some of our commoner scale insects, notably Scurfy scale and Oyster shell scale. These two are very widely distributed over the state and should

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be suppressed by aggressive spraying measures. We have also found that strawberry leaf rust may be satisfactorily controlled by spraying with Bordeaux mixture in early spring and again immediately after the fruit is harvested.

The spraying work in this state at large has been carried on by C. F. Gardner & Son, of Osage; J. P. Jackson, Glenwood, and B. A. Mathews, of Knoxville. Reports from these gentlemen will no doubt be forth coming at the proper time.

On leaving the state and taking up lines of horticultural work in the east, I wish to express my appreciation of the progressive spirit which pervades the aims of this society; to tender my gratitude and thanks to its officers and those who have helped me by encouragement, counsel and direct aid; finally to wish the society the fullest measure of success in working out those problems so intimately connected with the progress of prairie horticulture.

PROF. N. E. HANSEN: The vetches are quite common in Russia; they are used there as a forage crop; the seed can be had quite cheaply there, but here the cost of the seed will keep it from being tried very extensively until the price is reduced. We sowed some in the college grounds in May, and it is doing very well there now.

J. S. TRIGG: Is the seed small like clover?

PROF. HANSEN: No, it is more like a small pea. The crop is quite difficult to cure as hay.

J. S. TRIGG: Is it the same kind of tare that is said the devil sowed in the wheat.

ANSWER: Very much the same.

Vetches were recommended as making a good pasture for sheep. Buckwheat was also recommended as a good crop to keep the soil moist.

SELECTING FRUIT FOR EXHIBITION.

BY A. F. COLLMAN, CORNING.

Selecting fruit for exhibition is easier said than done. It is not difficult to select fruit for the show window, where the largest specimens are usually selected, then burnished with a soft flannel cloth. The fruit can be made very attractive to the casual passerby, but to prepare fruit for exhibition to be carefully examined by an expert horticulturist is quite another thing:

First. Select only average sized specimens. An over-grown specimen is just as objectionable as one of undersize.

Second. Select only perfect specimens, with good stem, regular basin, perfect calix, free from all insects and highly colored if possible. Select fruit with a heavy bloom, never erase the bloom, for a heavy bloom denotes quality of the fruit. The above applies to apples and other fruit.

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FRIDAY MORNING SESSION.

The session commenced with a lecture by Professor H. E. Summers, on "Insects that Work on Plums, Trees and Fruit," only a brief synopsis of which is given here.

Insects have been unusually bad this year, and it will pay us to spend some time and money in trying to save the fruit. From 30 to 50 per cent of the crop is taken every year by the insect enemies of the plum.

Over 100 species of insects are found on the tree and its fruit. Two of these attack the body, and do much damage to the tree, they are the peach borer and the flat-headed apple borer. The only remedy for them after they once enter the tree is to cut them out or kill them with a wire. As a preventive, washes have been used to destroy the egg or the young larva when it hatches and before it can enter the tree. Washing the tree with a strong solution of soapsuds or lye has been recommended, also the use of hydraulic cement. The cement is mixed with milk instead of water, and applied to the trees with a brush. The scarfy scale attacks the branches.

About eighty species are found on the leaves of the tree. The aphis are quite common. Spraying, to be effective against them, should be commenced in time. They live in colonies, and soon curl the leaves so that it is difficult to reach them with the spraying mixture. The kerosene emulsion is the remedy usually employed to destroy the aphis. A solution of tobacco stems steeped in four gallons of water is the usual strength of this insecticide. Spraying with whale oil soap in the spring, before the leaves start is beneficial in destroying many eggs of insects that have remained on the trees all winter, and also for the scale insects.

Of the insects which attack the fruit, the two most common are the curculio and gouger. You can distinguish these insects by their shape. The curculio has a hump on its back, and can fold its beak under the body; the gouger is without the hump, and can not fold its bill under its body. You can also distingush them by their work in the fruit. The curculio lives in the pulp, or flesh,

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of the fruit, while the gouger eats into the stone. The gouger matures within the fruit. The curculio live in the fruit until the the larva has completed its growth, then it enters the ground to complete its transformation. The curculio works on the cherry as well as the plum.

It requires considerable of an effort to get rid of these insects. Spraying will destroy some of them. A spray of arsanate of lead will not injure the foliage. The jaring of the trees and gathering the insects will reduce the number; the wormy fruit should also be gathered and destroyed. By persistent effort the number of beetles can be reduced. The warfare against the curculio should be kept up from the time the trees are in bloom until the fruit is one-third grown.

INFLUENCE OF THE LOCAL NURSERYMAN.

BY M. E. HINKLEY, MT. VERNON.

The good done by the local nurseryman is not appreciated in the majority of cases. He is in love with trees, intelligent and progressive. He is able and honest, and his influence is healthful and stimulating. In a business career of one or two decades he puts his mark on his community. He stamps his ideas emphatically upon his surroundings. If he has a specialty, and he usually has, it makes its way rapidly among his neighbors. As fruit grower and florist his successful efforts furnish a powerful incentive to do likewise.

In one case noticed the "local" was interested in cedar hedges. As a result his town was trikingly developed on that line, in marked contrast with neighboring towns which lacked the example.

Again the "local," devoted to a special variety of apple, filled his section with it, while in neighboring counties it was scarcely known. In another case the "local" found a peculiar hardy rose which he liked, and his community is fairly sown with the specimens of a variety not commonly seen.

Cases might be multiplied, but these illustrate the point, that the local nurseryman's taste has a marked effect on the horticultural development of his section. He is a leader and an educator. His advice is sought on a thousand points, and it is usually followed. Compare his work and influence with that of the traveling salesman for the distant nursery. The oily stranger is here to-day and gone forever. The home man is a permanent fountain of example and precept in a dry place. But few appreciate him, and he goes hungry for words of just praise and timely recognition. Happy is the town which includes this element among the factors of its progress. Yet he does his good work not only without appreciation, but in the face of opposition and detraction. There are men in every place who scoff and jeer at the "local." They belittle and misrepresent his work because they lack the information and good sense to appreciate it.

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But let the "local" take heart. His is one of the cases in which the good that men do live after them. He is an angel of blessing. In fact, such is the ill odor attached to the tree trade, that it might almost be said that the local nurseryman had stolen the livery of Satan to serve a good cause.

To be sure, the "local" is under what many might call disadvantages. He is obliged to be honest. He cannot sell tree strawberries and model orchards. He cannot be a "forty rod" liar like his traveling brother. Another disadvantage is that he is human and does occasionally make mistakes like the rest of us. Then he cannot escape the wrath of man like the brother mentioned. But the misdoings even of his rambling brother are visited on his devoted head and he must bow to the storm.

But there are lights as well as shades in the picture. If the "local" has reasonable gifts in a business way and is active and persistent, he can hold his own. Let him cultivate the "hippopotamus epidermis," and toot his own horn faithfully. He can make fair sales in spite of competition and detraction. He can get in his bills and collect enough of them to keep the balance on the happy side of the ledger.

It would be a dark day if the big commercial nurseries and their agents succeeded in crowding out, or starving out the "locals."

May Heaven long postpone the calamity. The local nurseryman is needed in every county in the northwest. May his tribe increase.

AFTER CULTURE OF THE STRAWBERRY.

BY C. G. BLODGETT, MT. PLEASANT.

I have been asked to prepare a paper for this meeting on the care of the strawberry bed after the crop is harvested until the winter covering is put on. There are several methods of "after culture" as we may call the care of the strawberry following the picking season. The one quite common, but not worthy the notice of the horticulturist, is the scythe or mowing machine. Perhaps the time has been when this kind of work would do, for small berries would sell, but of late years the market has been supplied with fine shipped berries for some weeks before our home berries were ripe, that, in order to get a fair price we must have very attractive fruit, good size, bright colors and free from sand and dirt, and this as a rule can only be attained by thorough cultivation and some kind of mulch. This means work and some of it hard work. Indeed there are not many things attainable in this world without some effort on our part.

There are two ways that I have practiced for the after culture. When the season shapes so that we may expect a good growth of plants I throw a furrow on each side of the row, away from the plants, leaving it only a few inches wide, then harrow and pull out remaining weeds. Cultivate as often as the first year, gradually widening the row of plants. This way virtually gives a new plantation, unless the season should turn off dry. In such case your next box order need not be large.

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The safest way, and the one I prefer and have practiced more of late, requires a little more work. I use my twelve tooth planet cultivator to drag out the old straw. which I haul off and stack for use again, then set my cultivator so as to leave just what plants I wish to grow for the season. The weeds growing in the row must be pulled or hoed out as cutting off only causes them to head low and foul the ground with their seed. The sooner this work is done after the crop is gathered the better. I never count the season over until my two year old bed is growing sweetcorn and my year old, now the old patch, has been put in as good condition as the new vines. After this clearing out the most of the work can be done with horse and cultivator. Should the season prove wet I use a sharp hoe to thin the plants for I know by experience that plant can be too thick, neither do I wish vacancies for weeds to fill.

If I had more ground to devote to strawberries, I believe that one crop and then plow under would be best, then there would be no weed seeds to ripen; it would destroy many. insects; a fine growth plowed under to enrich the soil and there is plenty of time in my latitude for a crop of sweetcorn or cucumber pickles.

I am practicing a rotation that is highly satisfactory, sweetcorn on plowing under the strawberry vines, potatoes the next year, and then follow with strawberries.

A few words as to winter covering and I will not tax your patience longer. The best results I have ever seen were from using old prairie hay, from necessity I used oat straw, the older the better, being freer from grain and weed-seed. Put on as soon as the ground is frozen enough to bear up wagon, spread evenly all over ground just enough to hide the plants. In the spring just as the plants are starting thin a little over the row, removing to the paths.

W. T. RICHEY: How may we destroy the saw flies, slugs and leaf-rollers?

PROFESSOR SUMMERS: Spray early in the spring with arsenic, usually two sprayings, about a week apart will kill them. Hellebore can also be used. The spraying should be continued until the berries are half grown. The plants should be sprayed in August and September for the second brood. For the leaf-roller it is better to use the mixture a little stronger than for the slugs, as follows: One pound Paris green, one pound fresh lime to fifty gallons of water. The arsenate of lead has also been used for the leaf-roller. Strength of solution, eleven ounces of sugar of lead, four ounces arsenate of soda, and 160 gallons of water.

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CARE OF RASPBERRY PLANTS AFTER THE HARVEST.

BY W. O. WILLARD, GRINNELL.

From the time cultivation commences in the spring until the berries begin to ripen, thorough cultivation is necessary to get the best results in size, quantity and quality of fruit.

During the berry harvest, which continues for several weeks, cultivation must necessarily cease, the ground is likely to become weedy and the soil between the rows to become packed and hard. To avoid this unfavorable condition, as much as possible, it seems very important, not only for the present crop, but for the benefit of the new growth that the plantation should be in as good condition as possible at the commencement of the berry harvest. The rows should be free from weeds and the surface of the soil mellow and loose, this also acting as a mulch, retaining the moisture which is very necessary to the raspberry in perfecting its fruit, or in the new growth of cane. After the berries are well formed and until the crop is gone there is comparatively little growth in the new canes which form the bearing wood for the next season's crop. The strength and vitality of the plant is used in perfecting the fruit now on the bushes.

The new wood being mostly made after the fruit is gathered the after treatment of our plantation therefore should be such as shall induce a growth of good, strong, healthy canes, which will be well ripened at the end of the growing season, without this healthy growth we cannot expect to get good fruit and plenty of it. The cultivator and hoe should be started as soon as the pickers are out of the field and they should be kept going until the ground is not only free from weeds but until the surface of the soil is finely pulverized. If level cultivation has been given, which is best early in the season, the soil should now be worked to the rows for winter protection and surface drainage.

This, in most cases, will be all the cultivation necessary, as the new growth is very rapid and will soon partly shade the ground and interfere with the further use of the cultivator. I would do no summer pruning. The new canes should be trimmed or pinched back in June, but the laterals should be allowed to grow through the season.

In the garden or where a few plants are grown, a heavy mulch of straw or other material may be used to advantage; in the place of the cultivation it may be advisable to cut out and burn the old wood immediately after fruiting, but I do not think it is practicable in a large plantation or where grown for commercial purposes.

All cap varieties are increased or propagated by layering the tips of the canes. This should be done during the last part of August and the first part of September. The tips should be buried from three to four inches to insure strong rooted plants.

It is claimed, and I think correctly, that a plant with the tips of the canes layered will come through an unfavorable winter in better condition than one not layered.

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HOW SHALL WE PLANT OUR GARDENS SO AS TO HAVE A SUPPLY OF FRESH VEGETABLES FROM SPRING UNTIL LATE IN THE FALL.

BY D. B. PATTERSON, DES MOINES.

The early garden is influenced by four important factors; first, location, which should be toward the south, aided by a windbreak on the north; second, the plat should be fall plowed; third, plant early varieties; fourth, cultivate shallow, as few times as will hold the weeds in check. These are four essential principles. The effect of location is very marked, especially during the early summer. The fall plowing is important, insects are disturbed in their winter quarters, the soil is benefitted by action of frost, moisture is absorbed and retained, and the injurious effect of trampling by the team on soil in a condition to pack, avoided. There are early varieties and be sure you get them. Shallow cultivation, ceasing as soon as weeds are subdued, is an aid to early maturity.

For a late garden reverse the conditions advised for the early one. It should be plowed early in spring, harrowed fine to induce weeds to germinate, and disked every two weeks to kill weeds and conserve moisture. About June 1st plow again before planting. Cultivate shallow and frequently and continue long as possible, unless a mulch is applied. We consider mulching one of the most beneficial operations for moisture loving crops, such as cucumbers, melons, tomatoes, etc. A heavy straw mulch applied from row to row just before they begin to vine will surprise and satisfy you with its results. The results are little cultivation, no weeds and increased production. Continuous late shallow cultivation is an essential in the late garden when mulching is not practicable; try applying these principles, using your own ideas as to how it is done, you will find products and and satisfaction where you have not before.

PEACH CULTURE IN SOUTHWESTERN IOWA.

BY J. P. JACKSON, GLENWOOD.

About forty years ago, I saw peaches growing in Pottawattamie county, but thought little of it at the time, as I was only about ten years of age, and having come from a state where peaches grow profusely along the roadside and in fence corners, I thought peach culture in Iowa was a matter of course. As years passed, others planted with varied success, while still others made light of those who had faith in peach-growing, just as they scoffed at the early planting of the apple.

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In 1869 I located in Mills county, where I found many small peach orchards. Although most of them were composed of seedlings, the trees seemed to thrive fairly well, yet most people looked upon fruit growing in general, with many mis-givings. The same fact is true to-day, notwithstanding that there are thousands of acres devoted to fruit, and hundreds of acres to peaches alone. I know several farmers who have made more money out of a few acres of peaches in the last ten years, than was realized from a hundred acre farm in corn. Some might say these are isolated instances, but they need not be, as there is no reason why one should not raise peaches, if his neighbor is able to do so. The reason why these parties have been successful in raising peaches, is this: They have made a practice of planting a few trees every year, and in that way, have been able to raise them. I find, by experience, that as a rule, the young trees are the surest bearers. I have in mind, one man, Mr. John Davidson, who has at least two thousand seedlings, all of the same type, and he will have perhaps five hundred bushels this season. Those trees passed through the winter of 1898, without the loss of a tree.

Yet, there is another matter to be considered, and that is location. I believe a man can learn much by studying the surroundings of his fruit trees. For instance, I may have the same varieties as my neighbor and yet not be as successful as he, especially if he should plant his peach trees in a protected location while my trees are exposed. This does not always prove true, as there are exceptions to all rules, in peach growing as well as in other lines of business. At our Horticultural Society meeting held at Council Bluffs in 1898, the peach was discussed quite extensively. Hon. Silas Wilson said: "I would use the word 'caution' in this work, and would not advise commercial planting, but believe they should be planted yearly for family use. In so doing, one undertakes but little risk, as the trees, if hurt, can be cut back, and they do not kill out entirely every winter."

If high lands with northern slopes are devoted to peach culture, I think a crop is assured three years out of five. Peaches grown in Iowa from five year old trees, are much better than those sent in from the western coast or any other location. The time is coming when southwestern Iowa will grow her own peaches. I believe this to be true, for we have sufficient evidence to corroborate this statement. In this connection, I wish to confirm a statement I made at the 1898 meeting, and which coincides with those made by Hon. Silas Wilson and others,—nameiy—"Locations have much to do with peach growing in southwestern Iowa." Mr. H. Burger has a large peach orchard, principally seedlings, which were loaded with fruit in 1898. They were not seriously damaged the following winter, and this season, his orchard is full again; while Mr. Jones, on a similar location, the same season, had a heavy crop of budded peaches, which were almost entirely killed the succeeding winter. While these are merely two instances out of many which occur almost every season, not only in peach growing, but in apples as well, they serve as object lessons, if we would only profit by them.

I would not recommend the entire planting of either budded fruit or seedlings, but would suggest the planting of both. Select the hardiest of the budded sorts, which have been thoroughly tested, and plant pits every year. Mr. Woodmansee, of Macedonia, Pottawattamie county, says, "I have planted largely in this country and while there is some risk, I feel safe."

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In conclusion, I want to call your attention to Mr. H. A. Terry's paper on peaches in the 1898 report on page 531. He is as good authority as anyone I can call to mind, and one who would not recommend any method of peach culture, unless he had implicit faith in it.

AFTERNOON SESSION.

President C. F. Gardner called the meeting to order at 2:00 P. M. The first business transacted was the appointment of Mr. M. E. Hinkley, of Mt. Vernon, to represent the society as a delegate at the meeting of the Department of Agriculture to be held in December next.

The secretary then read a letter from Mr. Langham, of Cedar Rapids, relating to the loss of a young vineyard by "root-killing," and asked that it be discussed by the society so that a reply, as to the probable cause of the injury, could be sent to him. After a discussion on the subject of root injury, the only conclusion apparently arrived at was, lack of moisture in the soil.

(The question raised by Mr. Langham will be found at length in "My Case Stated" under "Snap Shots," a paper read before the Southeastern society.)

TULIPS.

BY F. E. PEASE, DES MOINES.

Tulips are native to Central Asia and the Mediterranean regions. Through the evolutions of culture they have become so crossed and re-crossed that it is impossible to refer the plants to their original types. Owing to the great beauty of the flowers, tulips have been prime favorites in Europe for several centuries. This favoritism assumed a veritable mania in the early part of the seventeenth century. While this craze was really a form of gambling, in which the beauty of the flower was of secondary importance, yet out of it has come a great industry, the magnitude of which is but little understood. For many years Holland has been the great producing country and it is customary to refer to Tulips, Hyacinths and Narcissus as "Dutch Bulbs."

It may be that the long study, patient skill and perservering industry of the Hollander shall continue indefinitely to supply this country with "Bulbs," but it is the opinion of the writer that portions of this country can, and should, produce our own. Our personal experience is yet limited, but results with tulips during the last few years has been remarkably encouraging. We submit herewith a sample of our own growing which we challenge any place or country to excel.

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Whether we can grow such bulbs on a profitable commercial scale remains to be demonstrated. We, however, have sufficient faith to plant 25,000 this fall.

The soil in which these bulbs were grown was a deep, rich, friable loam, on clay. It would make a good potting soil. The ground was plowed, harrowed and planked until it was well and deeply pulverized, then hand raked. Each "bed" was made slightly sloping to the side paths. The bulbs were planted four inches deep, four inches apart in the rows and rows one foot apart. Before hard freezing the beds were covered with a good mulch of coarse litter. This litter prevents alternate freezing and thawing and keeps the soil moist and mellow for the free growth of the tops of the plants to the surface. The mulching not being removed until most of the plants had pushed through the surface. The plants were kept clean and well cultivated until time of flowering, after that nothing was done to them until digging time. The time to lift Tulips is when the tops are perfectly ripened and free from sap. The bulbs should be thinly spread in a cool, well ventilated, dark room or outbuilding for several days, then separated, cleaned of dead scales, etc., then spread them out as before until ready to replant. The small bulbs should be planted separately and not quite so deep. Most of them will bloom the second year. It is therefore advisable to lift the bulbs at least every third year. Unless weeds are allowed to grow, some shallow rooting annual should occupy the bed as a cover crop for the bulbs during their resting season.

The time to plant is soon as possible after September 15th. As imported bulbs cannot be obtained that early, a later date is usually recommended. But plant early as you can, for by so doing the bulbs become fairly well rooted before winter sets in.

The demand for bulbs is increasing just in proportion as people learn how easily they are cared for, how certain they are to bloom, and that just at a time when we need flowers most and can most readily appreciate them. Bulbs may now be obtained very cheap and, if you wish a gorgeous bed of glowing, beautiful Tulips next spring, prepare to plant this fall.

NATIVE TREES ABOUT OUR HOMES.

BY ELMER M. REEVES, WAVERLY.

A large part of the trees planted about our homes for shelter and oranament should be the native kinds. For timber the rapid growing sorts should be selected, unless you are willing to plant for future generations. While it is convenient and profitable to have a few acres of timber growing on the farm, it does not pay the individual to plant with the purpose of selling the product as the trees will not attain suitable size during a life time and the use of the land amounts to more than the timber will sell for at present. In Europe forests are grown on high priced land and at a profit, but the product is sold at a much higher price than in our country and every part of the tree is used, while in our wasteful way there is no profit.

No definite plan can be given for the planting of home grounds, but general rules may be laid down and details worked out according to taste of

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owner, lay and extent of grounds. Plan to shelter the buildings from winds and leave plenty of room between buildings and trees. More perfect protection and a healthier condition is obtained with trees at a distance of ten rods, or even more, and while shade trees are desirable near the dwelling they should be placed so that plenty of sunshine will be had and no damp places caused at or near the house. Avoid straight rows of trees except along roads and in the windbreaks. Plant in groups or singly and never in straight rows from front door to road. A group of trees is admissible in front of dwelling if an open view is left at each side so the highway may be seen in either direction from the front of house.

Evergreens are suitable for a back ground to buildings, also for grouping and as single specimens at side and front. Large growing forest trees should not be placed in front, and groups of deciduous trees should not be placed in front nor too near the buildings.

White Elm and Hard Maple are two of our best native trees and should be largely planted. If the top is cut off at proper height, say 20 to 30 feet, a thick bushy top will be the result and some of the finest speciments are the result of accidental breaking of the top from a tall tree. Hackberry is a nice tree and not yet appreciated by planters; so also with Basswood. Boxelder should not be named among the ornamental trees and it is too often planted because of its rapid growth. Neither is Black ash desirable while White ash is a beautiful tree. The Oaks should be chosen for their bold, rugged beauty and planted singly along fences, or in groups, in odd corners, or pasture lots, they add much to the beauty of the home.

It is hardly possible to plant at once all the trees that are required about the home. Plans will develope as we go along. Many of us would plan differently a second time, but it is hard to change large trees and many of them are like old friends from whom we do not wish to part.

Do not prune evergreens into unnatural or grotesque forms as they have too much the appearance of deformity, but as new growth starts it may be clipped when necessary to form symetrical tops. Much of the beauty of single specimens, or of the entire grounds, will depend upon the appearance of nature in form or arrangement, as no studied plan can outdo many a landscape or specimen tree grown without the aid of man.

Among the native evergreens that are valuable are the Arbor vitaes, among which are some fine dwarf varieties; Red cedar which grows rapidly when young and is hardy every where; Black spruce which is beautiful while young; White spruce of which there are at least two distinct forms; Silver spruce which is the most beautiful of all evergreens; Douglas spruce and Concolor fir, both beautiful and still classed as novelties. Last of all may be named the White pine, a native of our own state and the grandest of them all. It does not endure open exposure but with a slight protection it makes rapid growth and increases in beauty with age, remaining a joy to the owner after all the others have begun to loose their youthful beauty.

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INTEREST IN HORTICULTURE—HOW TO PROMOTE IT.

BY J. A. CALLISON, DES MOINES.

It is fashionable to have a hobby. One man collects rare coins, another goes in for thoroughbred chickens, a third has the bicyle microbe. It is not only a fashionable thing to have a hobby, but it is a good, wholesome thing. A hobby is a resting place. It furnishes recreation and renews youth. It is an anodyne and a safeguard against overwork and insanity. Every man, and woman, too, should have a hobby, a pursuit and an interest into which he can enter with keen relish, and a temporary forgetfulness of dollars and even duty. No matter if he degenerates into a crank, and is known as a monomaniac, he is all the more likely, from this lapse, to be sane at all other points.

The writer wishes to recommend horticulture as a hobby. Nature is the great restorer of wounds and bruises, physical, mental and moral. The devotees of horticulture get near to natures' heart. There is companionship in a noble tree. The eye that witnesses the unfolding of a beautiful rose, surprises nature in one of her great secrets. He beholds the birth of beauty springing from cold, inert clay and grose earthly elements—a wondrous mystery. The horticulturist comes in contact with the mighty forces of nature, and becomes a co-worker with her. He moulds, directs and controls the life spread in myriad form around him. Dull indeed is the heart that does not thrill at the sight of the tiny oak bursting through the ground from an acorn of his own planting. The writer will never forget the pride with which an old man once spoke of a noble grove in which we were standing. He had planted the seeds and had cultivated and pruned the little trees until they had grown to their then great dimensions. The grove was his creation, his handiwork, and would be his monument when he was dead.

But the love of horticulture should be put on higher grounds. It is not to be treated as a fad, or to be regarded as a matter of individual and differing tastes. It is a genuine test of refinement, of culture, of civilization. Every man and woman is born a gardner. Some men are too dull to see any beauty in a rose, others are too busy. Because women are universally fond of flowers, the admiration of floral beauty is sometimes regarded as an essentially feminine taste, but it is not so. Women care for flowers in a greater degree than men because they are more highly civilized than men. The man who boasts that he doesn't care for flowers should cultivate silence. If he can see no beauty in a majestic elm he shouldn't mention it. He is a spiritual hunchback, shun him.

The state society is doing a great work for the promotion of an interest in horticulture. But its meetings are poorly attended, and its membership, considering its vast importance, is ridiculously small. One of the best ways to promote an interest in horticulture is to join this society, and then go to

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work to induce a dozen others to do the same. It has, perhaps, never more than a hundred in attendance. Its roll ought to number 10,000. All the horticultural force of the state ought to rally to its support. Branches should exist in every town and county in the state. These branches should have stated meetings, and annually hold exhibitions of fruits and flowers. The possibilities of this kind of work are inexhaustible.

The College at Ames, through its horticultural department, is doing much good and valuable work. It should have the hearty co-operation of every tree man in the state.

The horticultural pen contributes much, but as a rule the papers are poorly sustained by the people. We should do everything possible to extend their circulation. Besides these the city daily and the county weekly should be pressed into service by every gardener and fruit grower who has something to say for horticulture.

Horticultural knowledge and interests should be fostered by school boards and school teachers. The elements of this science should be taught by the public schools. They are not, however, and will not be for many years to come. Horticulture is taught in all the schools in the world but ours, but teachers are worked to death teaching the difference between a pronominal adjective and an adjective pronoun, explaining and comparing bank discount and true discount, and drilling the children in the terms of the Missouri Compromise. It is not the teacher's fault, either. It is the fault of our absurd system. Why should three-fourths of the time in school be taken up with an utterly worthless grind? Why should'nt the children be taught something of practical value. Take one illustration. Thousands of dollars are thrown away in Iowa every year because people who buy trees don't know how to plant them. Yet, at school, a boy of ten might be taught easily in half an hour; in less time than he could learn the difference between a synonym and a hononym. Every once in a while some unsophisticated enthusiast get up in a horticultural meeting and reads a paper on "Horticulture in the Public School." One would think from his confident manner he was going to have it introduced into the schools right away, but he is reckoning without his host. We must not expect any help from the public schools.

For the systemmatic and steady growth of horticultural interest we must look mainly to the nurserymen and their enterprising helpers, the peddlers, of which latter more anon. Nurserymen are vitally interested in the subject. It is a matter of bread and butter with them. Some suggestions to them may not be amiss. Their catalogues should give as large an amount of information as to proper planting and culture as their space will permit. Their catalogue should give accurate descriptions, and when new varieties are advertised it should be stated whether the description given is that of the introducer or of the nurseryman himself. They should send out everything scrupulously true to name. This is a matter of immense importance. People would try twice as many trees and plants as they do if they could feel a reasonable assurance that they would get what they want. Their salesmen should be honest, intelligent men, who would tell the truth, and who are capable of instructing the people in horticultural knowledge.

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Now, a word or two to the tree-peddler—the fellow who gets out with his bottle of fruit and his gorgeous pictures. With all of his faults he is a useful man. He is too much abused and too much vilified. He suffers vicariously. He has his own sins to bear and many others. He is held responsible for the mistakes and duplicity of the nurserymen, his employer, and when a tree dies from winter's cold or summers's heat, from pestilence, famine or drought, the club is raised over his head. Horticulturally speaking, who-ever has a disappointment, who ever has a grievence, who ever has a bad temper turns himself loose on the tree agent, and woe to him indeed. He serves them one useful purpose, if no more, he is the scape-goat led out into the wilderness. All horticultural sins are laid on his back. He is thought to furnish a good proof for the doctrine of "Total Depravity," and there is an ingenious theory that the devil was the original tree-agent. You will remember that when he appeared in Eden he was introducing a new apple—probably a Russian variety. Let me say a word for the tree-agent even at the risk of being egged. Several times out of a dozen he is an honest man. He is certainly the most potent means now employed in the spread of horticultural interests. As a rule men wont buy trees of their own free will, they have to be coaxed, cajoled, dragged into it. The nurserman may appoint a rich horticultural feast, and send out invitations in gilt and gold, in the form of expensively gotten up catalogues, but he may wait in vain for his company. Then the agent is sent for, and he goes out into the highways and by-ways, and compels the guests to come in. Now, the man who, by his pursuasive talk, forces some close-fisted farmer to set out an orchard who had none before, or some city dweller to plant roses where ragweeds grew, deserves the tribute of a passing good word.

The tree-peddler—he is not a peddler, but is so dubbed in contempt—is a man of seductive eloquence. He has perseverence, energy and the gift of tongue. His language is always exagerated, and those who know him discount his descriptions heavily. His apples are large and red, alas, too large and too red; his peaches will stand any number of degrees below zero, and above all things, his nursery is the largest and best in the world. Be not too hard on him for this, nor impute it to him as a fault. It is the way of the world. He knows that nearly everywhere he is regarded as a nuisance, but he persists. He has become an expert in dodging social and moral brickbats. He is impervious to insults. He fattens on snubs. He is not afraid of dogs. He knows that he is not a malifactor, but that on the contrary, if he can wheedle man into "signing up" he is doing him good. If carried away by zeal or momentary excitement he sells some credulous old lady a sky blue paeony or promises a confiding farmer an orchard that will come into bearing in two years, he trusts that his nursery will, by some means make good his covenant. At any rate. he hopes in the end to get divine forgiveness, and to baffle St. Peter at the gate.

Let us hope that he may. Whatever have been the methods his work has been beneficient. It is largely to his push and energy that we owe the debt for the thousands of orchards which dot the once barren prairies, the stately groves and the ornamental grounds which surround so many beautiful western homes. Certainly the man who leaves the world richer, more habitable and more beautiful than he found it, has lived to a good purpose.

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A STUDY ON FRUIT BLOOM.

BY W. GREENE, DAVENPORT.

For two years we have been gathering data of the time when fruit trees were in bloom. The object of the inquiry was to establish the thermal zones in the state by observations in horticulture instead of meteorology. The reading on the horticulture thermometer is about as reliable as that on the mercurial instrument. In either case we must reckon with heat as the dominant expansive force.

We will briefly state the case in a few words, that to give in detail would require many pages. The sun in its apparent motion passes over 47° of latitude in six months, or at the rate of one degree of latitude in four days. But the apparent motion is faster as it approaches the equinox so that only three days are necessary to traverse a degree. At that rate it would require nine days to cross the three degrees in Iowa. In other words, Allamakee county would not receive the same amount of heat and light as Lee until nine days later, when the sun's rays would fall at the same angle. This is only a rough statement, not an accurate one. Were it not for the expansive and mobile qualities of the atmosphere it would be an easy matter to compute the amount of heat either place received in a given time. But when we come to apply mathematics to this problem we fall into a sea of almost infinite varibility to struggle, strangle and sink in a few moments. But in this extremity we would have you grasp three thoughts: First, dry ground is a source of heat by radiation and reflection. Second, water as an absorbent and distributer of heat. Third, that 51½° of heat are necessary to produce bloom in the class of plants we have under consideration. The last proposition being true we ought to find trees beginning to show flowers along or near the thermal line of 51°. With these three propositions before the mind we are ready to follow the isotherms as they wabble across the state to see if we can find any trees in bloom along the pathway.

The maps for April, 1899 and 1900, show the average temperature on the morning of the first day of May. In 1899 there were nine thermal lines present, 54° to 46° inclusive, and in 1900, eight, 56° to 49°. The normal temperature for April is 49.5°, so that April, 1900, was 2.7° degrees above the average temperature for that month and ought to be three days earlier, and so it proved to be by the tree record. Last year the first bloom was reported from Mills county on the 29th. (See page 333 of Vol. 34.) This year it was reported from the same place on the 26th, just three days earlier.

In 1899 the isotherm 51° ran through Clinton, Linn, Van Buren, Fremont and Pottawattamie counties on April 30th. In 1900 it was in Allamakee, Buchanan, Kossuth and Lyon counties. The eastern part was colder, relatively, in the spring of 1900 than in 1899, as compared with the central and western part of the state.

The dates on the margin of the maps show the days on which the trees commenced to bloom between the thermal lines, and the figures in the counties show the temperatures. Trees sometimes show flowers a week before they are in full bloom. The first date in the record given is when one-fourth of the flowers are open, and full bloom usually follows in two to four days.

Below is given a few of the reports for 1900. The first three are between the lines of 50° and 51°, the next four between 52° and 53° and the last two between 55° and 56°. The figures after the varieties as 5–9 represent the days the trees were in bloom; 19 to 30 are for April, and 1 to 12 for May.

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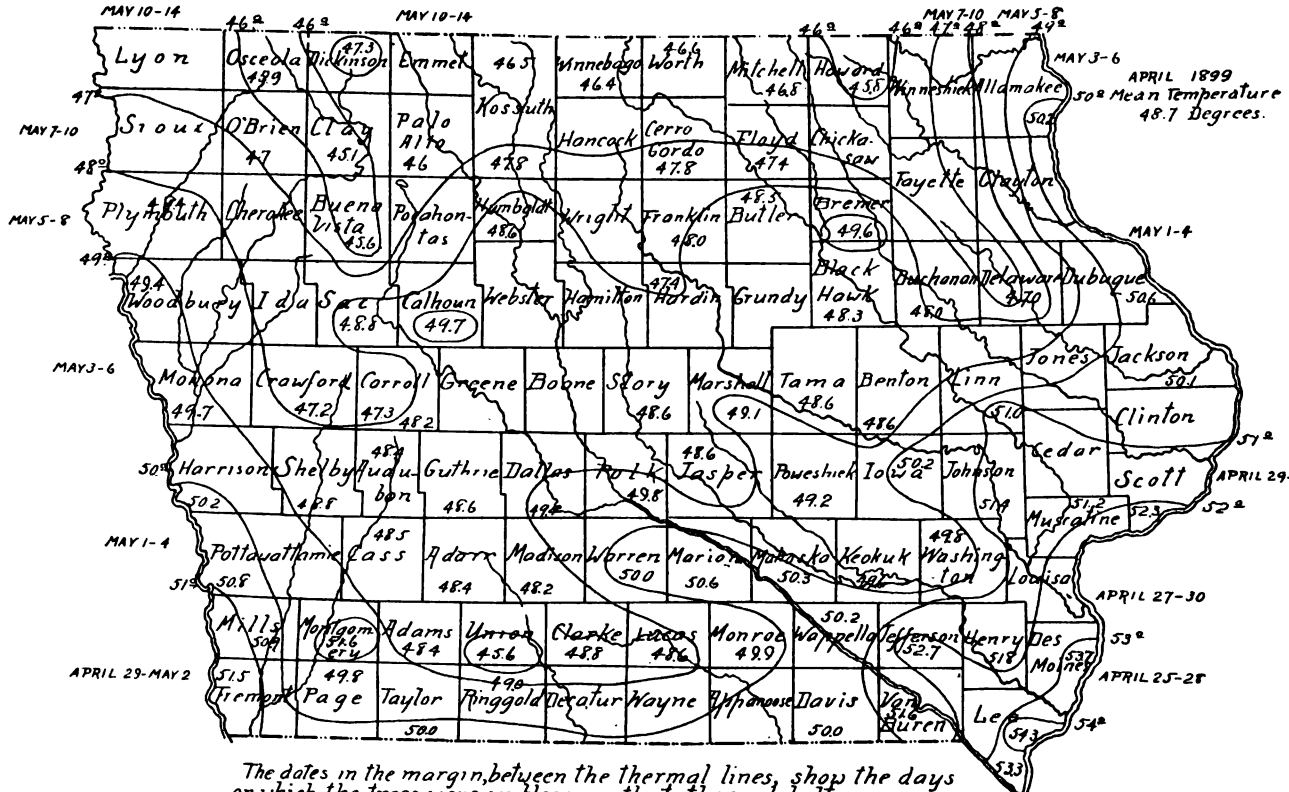

The dates in the margin, between the thermal lines, show the days on which the trees were in bloom in that thermal belt.

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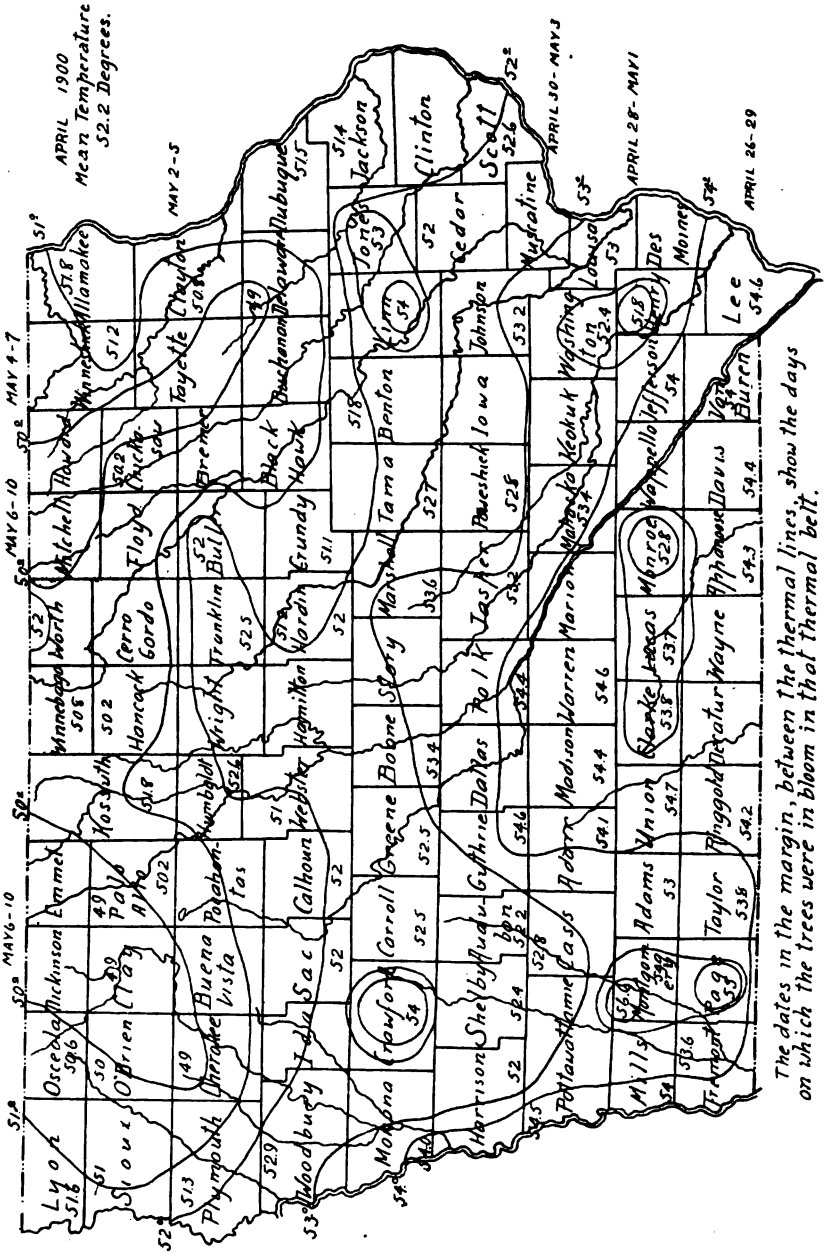

The dates in the margin, between the thermal lines, show the days on which the trees were in bloom in that thermal belt.

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REPORTS ON BLOOMING OF FRUIT TREES IN 1900.

COUNTY.	OBSERVER.	APPLES	PLUMS.	CHERRIES.
Winnebago	Eugene Secor	Oldenburg May 5- 9 Wealthy 7 Whitney 6- 9 Ben Davis 10 Longfield 5- 9	Wolf May 5- 8 Forest Rose 6 9 Hammer 6- 9 Stoddard 3- 7 Aitkin 29- 4	Early Richmond May 4- 7
Dickinson	H. N. Antisdel	Oldenburg 6 10 Wealthy 8-11 Fameuse 9-11 Whitney 9-10 Lowell 10 12 Haas 10-12	Wyant 5- 7 De Soto 6- 8 Miner 8 12 Stoddard 5- 8	Wragg 12-14 English Morello 11 13
Cerro Gordo	W A. Burnap	Oldenburg 4- 8 Wealthy 6 10 Fameuse 6 10 Whitney 4- 8	Aitkin 21-28 De Soto 4 8 Miner 6 9	Early Richmond 4-
Monona	Christian Steinman	Oldenburg 28- 2 Wealthy 2- 6 Fameuse 4 9 Willow Twig 4- 8 Whitney 1- 8	De Soto 1- 4 Miner 30- 5 Communia 1- 8 Abundance 23-29	Early Richmond 28- 4 English Morello 4- 9
Iowa	Millard Harrington	Oldenburg 1- 5 Wealthy 3- 7 Fameuse 1 6 Willow Twig 3- 7 Whitney 1- 5 Benvin 30- 4 Roman Stem 1- 5	Wolf 29- 1 De Soto 29- 1 Miner 29- 1 Forest Garden 28-30 Lombard 27-30 Little Blue Damson. 28- 2 Burbank 27-29 Satsuma 27-29	Early Richmond 30 6 English Morello 1- 6 Ostheim 28- 4
Harrison	W. J. Worth	Oldenburg 1- 4 Wealthy 2- 5 Ben Davis 2- 6 Whitney 27- 3 Arkansas Black 4-10	Forest Garden 20-24 Miner 23-27 Handsome 20-24	Dye House 22 27 Early Richmond 23-28 English Morello 25- 2 Wragg 25- 2 Montmorency 24-29

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REPORTS OF BLOOMING OF FRUIT TREES—CONTINUED.

COUNTY.	OBSERVER.	APPLES.	PLUMS.	CHERRIES.
Muscatine	W. S. Fultz	Oldenburg April 29- 2 Wealthy 29- 2 Fameuse 29- 3 Willow Twig 29- 3 Whitney 28- 2 o m an Stem 30- 3 Black Annette 29- 2 Ben Davis 29- 3 Iowa Blush 29- 3 Jonathan 30- 3 Grimes Golden 29- 4 Warfield 28- 2	De Soto April 29- 2 Miner 29- 2 Hammer 29- 1 Bixly 29- 1 Charles Downing 30- 1 Quaker 29- 1 Forest Rose 29- 1 Bassett 1- 4 Hawkeye 28- 1 Wild Goose 29- 1 Weaver 28- 1 Milton 29- 1 Forest Garden 29- 1 Whitiker 29- 1 Wolf 29- 1 Cheney 26 29 Willard 26-29 Kelsey 26-29 Satsuma 28- 1 Botan 26-29 Chabot 26-29 Burbank 26-29 Lombard 26-29 Tatge 26-29 Communia 26-29	Early Richmond April 26-29 English Morello 29- 1 Montmorency Ord 26-29 Large Montmorency 29- 1 North-West 26-29 Lutooka 28- 1 Abbess 29- 1 Wragg 29- 2 Ostheim 27-20
Pottawattamie	H. A. Terry	Oldenburg 27-29 Fameuse 27 Whitney 27-29 Jonathan 28	De Soto 29 Miner 28 Hawkeye 27.28 Cheney 26-27 Hammer 26-27 Burbank 19-22 Champion 25-26	Early Richmond 28 English Morello 28 Wragg 26
Mills	J. P. Jackson	Oldenburg 26-29 Wealthy 29-4 Fameuse 28-2 Willow Twig 30-4 Whitney 25-1	De Soto 26-28 Miner 28-2 Lombard 25-28 Burbank 19-23	Early Richmond 22-30 English Morello 28-30

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Every three days the temperature has increased one degree, and the thermal line has moved farther northward, although it may not follow the same course as the one on the three days preceding it, because it may be modified by the daily changes of clouds, wind or rain. How frequently we notice the blossoms delayed by clouds and cold rains that when the sun comes out, apparently burst at once into full bloom. Should a rain storm extend over 50 or 100 miles of the state while in the other portion it was clear the difference of one day might be apparent; or a drouth, or excessive precipitation in another might change local conditions several days; though they would not have any appreciable effect on the great cyclonic waves of atmosphere which sweep over the continent every few days. Their effect would be local and their influence extend only in proportion to their size or intensity. A building does not stop the sweep of the wind, but there is a perceptible calm on the leeward side of it A rock in the channel does not change the course of the current but it may cause a ripple on the surface.

How much light is necessary to develop blossoms has not been determined. Our Weather and Crop Service ought to have instruments for measuring the intensity of light as well as of heat for it is as an essential element in plant growth.

There is another record we ought to have; that is, temperature of the soil one to four feet below the surface. Very little data has been collected of soil temperatures over large areas for any length of time so as to determine the influence of drouth, or excess of moisture, or to see how the thermal lines beneath the surface of the ground correspond with those in the atmosphere. Then what effect has the stock on forcing or retarding growth? We refer to cherries that have been budded and are not on their own roots. We would liketo have 1,000 reports on the cherry in this state on its own roots, on Mazzard, on Mahaleb and on Morello stocks to see what the result would be from such cumulative testimony; who knows?

The observations at one station are of little value in determining questions of this nature, unless carried on for a series of years, and then you do not get the variation in trees, but where many observations are made, under varying conditions, with different trees of the same variety better results are obtained.

In 1900 the Early Richmond cherries ripened in 42 to 46 days from the time the trees were in bloom. This was, probably, less than the usual length of time required because the temperature of May was 3.5 degrees above the normal, though June was 0.3 below the normal for that month; but for the whole time there was an excess of over one degree of temperature. The indications are, from data collected in the last two years, that it requires a longer time for both the blossoms and fruit to mature in the northern counties of the state than in the southern tier with seven degrees more of heat.

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FORESTRY AS A NATIONAL PROBLEM.

BY L. H. PAMMEL, AMES.

As I look at the subject of forestry, it is one of the big problems that confronts the American people of to-day. Not only are we interested in the state of Iowa, but in every city and village in the United States. The subject of forestry is one that should appeal strongly to them, not only because of the lumber we use for our buildings and other purposes, but also the influence of forests upon the climate and such matters as the retention of moisture and its influence upon the flow of water in streams.

Let us briefly take a retrospective view of the subject of forestry in this country. Scarcely a decade ago, so little interest was taken in the subject of forestry that the American Forestry Association could barely get together a handful of men who were exponents of a more rational system of forest protection in this country. During the early settlement of the northwestern states, particularly Indiana, Illinois, Wisconsin, Minnesota and Iowa, it was a common practice to make farm land of the forests by burning the timber in large heaps. In those days it was thought that a wood-covered area was the best land and prairie openings were carefully avoided. It was thought that our timber supply was inexhaustible, but great changes have been brought about during the last fifteen years. Now, of course, while some of this clearing and waste of timber was essential to make way for civilization, the time has come when every resource for timber supply should be husbanded carefully. The whole eastern country was one great forest, but all this now is changed. The magnificent coniferous and deciduous forests of eastern and northern America have in many places given rise to valuable farms. I would not underrate their value and what these farms have done for the American people. The richness and vastness of these forests are so well described by Dr. Gray:

"In speaking of our forests in their present condition, I mean not exactly as they are to-day, but as they were before civilized man had materially interfered with them. In the district we inhabit such interference is so recent that we have little difficulty in conceiving the conditions which here prevailed, a few generations ago, when the 'forest primeval'—described in the first lines of a familiar poem—covered essentially the whole country from the Gulf of St. Lawrence and Canada to Florida and Texas, from the Atlantic to beyond the Mississippi. This, our Atlantic forest, is one of the largest and almost the richest of the temperate forests of the world. That is, it comprises a greater diversity of species than any other, except one."

The great inter-mountain region west of the Mississippi and north of Missouri, contains practically few forest areas and especially beyond the Missouri and east of the Rocky mountains, the forest covering is so light and so patchy that it could never have an important bearing upon the sub-

Forest Geography and Archaeology. From Am. Jour. Sci. and Arts, 16:85. 1878.

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ject of forestry. The Rocky mountain forests are not extensive, only occurring in small patches here and there, except in the more favored localities. This is likewise true of the eastern slope of the Sierras; however, on the west side of the Sierras and especially in northern Montana, Washington and Idaho, Oregon and California, the forest covering is much more important.

According to Mr. Henry Gannett the timber distribution in the different states is as follows:*

State.	Square Miles.	State.	Square Miles.
Maine	23,700	Ohio	
New Hampshire	5,200	Indiana	10,800
Vermont	3,900	Illinois	10,200
Massachusetts	4,200	Michigan	38,000
Rhode Island	400	Wisconsin	31,750
Connecticut	1,900	Minnesota	52,200
New York	18,700	Iowa	7,000
New Jersey	3,234	Missouri	41,000
Pennsylvania	23,200	North Dakota	600
Deleware	700	South Dakota	2,500
Maryland	4,400	Nebraska	2,300
District of Columbia	12	Kansas	5,700
Virginia	23,400	Indian Territory	20,000
West Virginia	18,400	Oklahoma	4,400
North Carolina	35,300	Montana	42,000
South Caroiina	20,500	Wyoming	12,500
Georgia	42,000	Colorado	33,500
Florida	37,700	New Mexico	23,700
Alabama	38,300	Arizona	25,000
Mississippi	32,300	Utah	10,000
Louisiana	28,300	Idaho	35,000
Texas	262,290	Washington	47,700
Arkansas	45,000	Oregon	54,300
Kentucky	22,200	Nevada	6,100
Tennessee	27,300	California	44,700
Total			1,094,496

FORESTS—THEIR VALUE.

As I have intimated before, the forests must be considered under two heads. First, as the source for the supply of lumber, second their value as physical factors.

Considering now the first proposition, we find that the annual consumption of timber in the United States amounts to about 27,000,000,000 feet. Formerly a very large supply of timber was obtained in the east, now the people in the Mississippi valley are depending for their lumber not only from the southern states but from the Pacific coast, and before many years, will be importing large amounts of lumber from other countries. Timber is an agricultural crop, and, unlike most other agricultural crops, it takes years for the tree to attain its value for timber.

*Henry Gannett. Forest Reserves. U. S. Geol Surv. 20:

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In our own country, some of the progressive people are taking a hand in the protection of forest reserves, and this is where Mr. Pinchot of the United States Department of Agriculture and Disvision of Forestry is doing valuable work. On this important point, Mr. B. E. Fernow states:*

"In an average of a hundred years the yearly growth, according to species, soil and climatic conditions, would vary between 30 and 180 cubic feet of wood per acre each year. But, unless firewood is the object of cropping, it is not quantity of wood, merely, but wood of given size and of given quality, wood fit for the arts, that is to be grown. Such wood alone it will pay to raise. Hence, it is necessary not only to know what sizes can be grown in given periods of the life of the crops, and that sizes can be profitably handled at the mill or in the market, but also what qualities are desired and under what conditions they can be produced. Trees develop very differently at different periods of their life. Thus, while a white pine tree may, in the first fifty years, have grown on an average one-third of a cubic foot per year, if we had waited till the hundredth year the average rate per year would appear as more than one cubic foot, and the total volume four to five times what it was at fifty years, although the diameter has only about doubled. Again, while at fifty years, hardly more than 15 per cent of the total wood volume would have furnished saw timber, perhaps making 50 feet B. M., at one hundred years, the proportion of more valuable milling material would have risen to forty per cent and more of the whole tree, and the output of timber has reached 500 feet B. M."

H. S. Graves, in speaking of "Practical Forestry in the Adirondacks," says:†

"The state would have a special advantage over the private owner in being able to enforce stricter regulations on the contractors in regard to the careful construction of roads, sparing the small growth in felling timber, in building skidways, bridges, etc., and lopping the branches from the tops as a protection agains fire. The lumberman can carry out these regulations only so far as they do not to any great extent affect the cost of logging. Moreover the state could employ a much larger force of experts to superintend the marking of timber and to watch the work of the contractors, or, in other words, could take better care of the forest than the private individual."

Filbert Roth, in an exhaustive treatment of the "Forestry Conditions and Interests of Wisconsin"‡ makes the suggestion that, "To those who are astonished at the mere idea of planting forests and who scorn the European methods as impracticable in this country it may be of interest to know that in Saxony, where the most intensive kind of forestry is carried on, an area of 400,000 acres, or about two-thirds as large as Lincoln county, (Wisconsin) brings the state a net income of nearly $2,000,000, furnishes regularly every year to consumers about 20,000,000 cubic feet of wood, so that pulp mills and saw mills have long become permanent institutions, and that in this state where forests are largely planted with nursery stock, the sylvaculture work of planting, sowing, etc., all told, amounts, on an average for the entire woods, to ten cents per acre per year, and involves only six per cent of the total expenses, which in this case includes all logging operations. Whether all these efforts will pay as long as the land is held by

*Yearbook, U. S. Dept. Agr'l., 1897: 152.
†Bull. U. S. Dept. Agr. Div. For., 26:14.
‡Bull. U. S. Dept. Agr. Div. For. 16:57.

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private owners, whose fortunes are only of today and whose heirs will prefer to parcel the land out to inexperienced settlers, can not here be considered. The experience abroad and also in this country indicates that the state must at least undertake the care of the most difficult and unprofitable parts, and and that the greatest good to the greatest number lies in state ownership of forests. New York waited a long time to see private owners manage rationally its woods, but has been compelled at last to buy the land and to establish a forest organization to keep its mountains from being converted into desert brush lands and its streams from being alternately dry branches and mud torrents. A similar movement in Wisconsin would at present be greatly facilitated by the present conditions of ownership. The land is still held in large bodies and by men actively engaged in a business quite distinct from speculation and by dealing in real estate, and therefore a transfer could be effected in most cases very easily and at prices (25c to 50c per acre) which would seem to guarantee financial success to forestry even in the backwoods of Wisconsin."

In older countries, especially in Europe, they have found it essential and necessary to protect the forests. With an increase in population it was found that more land was required for the production of field products, western continental Europe was largely forest covered, large areas were thus removed of their timber and in course of time it looked as though the forest would not reproduce itself. Certain people protected certain wooded areas, preventing the encroachmen tof individuals upon them. Mr. Schlich in speaking of this question says:*

"As long as forests occupied considerable areas, their product was considered the free gift of nature, like air and water; man took it, used it, and even destroyed it, without let or hindrance. Hence forest utilization is the oldest branch of forestry. With the gradual increase in population, more land was required for the production of field crops, and this was taken from the forest area; reckless cutting and burning consumed more forest, until a time came when it appeared doubtful, whether the natural woodlands could continue to yield the required produce for any length of time, if treated in the manner so far customary. This caused propriety ideas to be developed; people claimed the ownership of certain forest lands, proceeded to protect them against outsiders, and thus the first signs appeared of that branch of forestry which is called 'Forest Protection.' The protection originally designed against man oniy, extended gradually to measures which has for their object the preservation of forests from injurious attacks by animals, especially insects, noxious plants, particularly fungi, natural phenomena and other calamities. By degress it was found that mere protection was not sufficient, and that steps must be taken to enforce a more judicious treatment, and to limit the cuttings to what the forest was capable of producing; in other words, to determine the annual, or periodical production, and to regulate the yield accordingly. Thus that branch which is called 'Preparation of Forest Working Plans' sprang into existence."

Mr. Henry Gannett, in a recent article in *Forum* makes the following statement with reference to the timber interests of this country:

"I have come to the conclusion that the average stand upon the wooded lands in the east probably does not exceed 1,500 feet. The area of the wood land

*Manual of Forestry, 1:2.

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in this part of the country is a little less than half a billion acres. The stand of timber upon it, therefore, may be in the neighborhood of 750,000,000,000 feet (B. M.). With that estimate in the west, 630,000,000,000, the total stand in the country would appear to be approximately 1,380,000,000,000 feet (B. M.). In 1890 the cut was about 25,000,000,000 feet, and since then the annual cut has somewhat increased, The present stand would therefore supply the present rate of consumption for about fifty years. As a random statement, then, it may be said that we have timber in stock sufficient to last the present demand of our industries for nearly two generations. Some species, however, which are applicable to certain purposes, such as the southern pine, the redwood, the red fir, will last longer than others, and some species, like the black walnut and the white pine, are already nearly exhausted."

Two questions come before us in considering the subject of the forests as a national problem. First. Would it pay the land owner or lumberman to retain in his possession large areas of land for the purposes of opening an agricultural crop. Second. Should the government and state assume entire control of large forest reserves and thus reap the benefit of these forests.

Mr. Pinchot in discussing this question suggested that a definite tax rate be maintained for the forests.*

"The whole problem of private forest lands is summed up in the question, can I afford to hold my land for a second crop? Every forest owner must answer this question before he begins to cut, even though he may never put it to himself in words. The first consideration that arises is that of taxes. 'What will it cost me,' reasons the forest owner, 'to pay taxes on my land for the years which must elapse between this cut and the next. It will take so many years for the crop to ripen, and during that time I must pay yearly so much per acre in state and county taxes without getting any return to offset the expense. I could bear the cost of protecting my timber from theft, and even from fire, but can I stand the taxes?' The general answer is 'no.' Here is the key to much, if not most, of the destruction of forests by lumbering in this country—this and the fact that the methods of conservative lumbering are not well known among men interested in timber land. It is true that many considerations have weight, such as the necessity or desire to take every stick that can be moved at a profit over an expensive railroad, pole road, or slide, or driven with the help of a costly dam, none of which will ever be used again. But the reason why they can serve but once is not free from the taint of the tax question. It will not pay to hold the land for the second crop because of the taxes, and so all of the improvements are put in with the intention of moving them away or abandoning them when the timber is cut."

THE ESTABLISHMENT OF A NATIONAL FORESTRY POLICY.

The government is taking active steps in preserving the original forest areas of the Philippine Islands, and it seems that Spain, though backward in many lines of work, had maintained a rational forestry policy which was established some thirty-five years ago.† This bureau employed sixty-six foresters, as many rangers, and forty other subordinates supervising the government forest property. This forest embraces an area of twenty to forty million acres and many valuable economic trees, among them rubber trees. The

*Yearbook of the Dept. of Agr. 1898: 183.
†B. E. Fernow. Science N. S., 12: 810

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Secretary of War and the Secretary of Agriculture are now taking active steps to have large parts of this original forest set aside for commercial reasons.

It is fortunate that the government is now beginning to start a rational forestry policy. The European governments were by slow degrees driven to establish a policy of this kind. The European governments received excellent returns for the outlay of their money and it is fortunate that the people of this country are beginning to see the importance of establishing these forest reserves for the proper maintenance of forests, but a rational forestry policy cannot be maintained until young men are especially educated along this line of forestry. And while we may talk of the many other important industries of this country such as the mineral resources, these pale into insignificance when compared to the money that is expended for the supply of timber for fuel and domestic purposes. So that every state in the union should give a thorough course in forestry. It is, indeed, a good sign to note that some of our institutions have established schools of forestry, notably Cornell University and Yale University, the latter through the liberality of the Pinchots, Mr. Gifford Pinchot being the forester of the United States Department of Agriculture.

The forest reserves should be manned by men who have had training in forestry and the sciences underlying it. Until we pursue a policy of this kind can the subject of forestry receive its due attention, and we hope before many years to be able to see that the forest reserves are placed under the direction of the department of agriculture, being in charge of the forester of the division. I say this because it seems to me that that is the only rational policy that could be pursued by the government in treating of the forestry question, because there are many problems coming up that can only be solved by a person who is trained intelligently along these lines.

In many of the state agricultural colleges and universities good courses are given along the line of forestry. In fact in more than one of these institutions the chair of horticulture is combined with forestry. But more than that, these institutions should have at least an adjunct professor of forestry, one who is strongly trained along botanical lines. The men turned from these schools should certainly be capable of managing our forest reserves. Europe has long since learned the lesson that forestry is a business and as such can only be carried out by men specially trained, not only in the sciences that underly forestry, such as botany, zoology, soil physics, surveying, but in the more practical questions of lumbering and forest management. It is time that a much wider interest be manifested along this line.

It is a healthy sign also that several of the states of the United States are preparing exhaustive surveys and reports on the forest conditions of their respective states. For instance Wisconsin has undertaken work along this line. Minnesota is doing most active work along this line. The people of the state are taking a most active interest in forestry, supporting a good forestry association, as well as publishing information along the line of forestry. I refer especially to the little book that was publishey by Prof. Samuel B. Green*. And the state of California is also doing some active work along this line, having established state forest reserves. Speaking of one of these, a writer** in the report of the University of California, says:

*Forestry in Minnesota.
Rept. Ag. Exp. Sta., Univ. Cal. **1897-8: 328.

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"The Chico forestry station was originally a part of the famous Rancho Chico (26,000 acres), belonging to the late General Bidwell. This great estate contains some of the finest oak groves known to exist in California. Portions of it still remain as wild as when the Sacramento Valley was discovered, and have been the delight of such botanists as the late Dr. C. C. Parry, the late Proffessor Asa Gray, and Sir Joseph Hooker."

Our own state has fostered the subject of forestry in so far that it lessens the burden of taxation for some of the forest lands, and during the early years of the State Horticultural Society several publications on the subject of forestry were issued.

It was my privilege during the past season to have gone through the Uintah Forest Reserve, covering approximately an area of 860,000 acres of land. Now since 1879 more than seventy-five per cent of this forest area has been burned over, and probably since the beginning of this century nearly the entire forest has been more or less burned over. In fact when going through these burnt forests one frequently finds that the logs of two generations remain. And one is struck with the enormous amount of wastefulness, especially the good lumber material that is going to waste in these forest reserves. The fires, not only do they destroy and materially injure the timber, but they prevent the proper reforestation by burning the humus. It is found from practical experience that it takes a long series of years before the forest can again be properly covered with a proper timber growth. Thus I found in northern Colorado and Wyoming that it took all of the way from ten to twelve years before reforestation occurred, and in Utah I found that where the areas had been burned in the year 1879 that there are now young trees coming on that vary in age from ten to twelve years.

It has frequently been claimed that these forest fires are started by cattle and sheep men to make better food for their stock, but this, it seems to me, is entirely erroneous, for such a burnt forest at least for a number of years, is not capable of producing anything in the way of timber growth nor of herbaceous plants.

Nearly all the fires are started carelessly, and not only is this done carelessly by cattle and sheep men, but frequently by persons who go to the reserve for fishing and hunting. Frequently these people use so little judgment in making the fires, pay little or no attention to the government regulations in regard to the extermination of fires, that the fires burn for a considerable time. When the fire gets into the fallen timber it keeps on smouldering for weeks, and a fresh breeze may give a fire renewed start. Thus it is a very serious question to deal with these forest fires.

THE RELATION OF FORESTS TO RAINFALL.

There is a widespread belief that forests very materially influence the rainfall of a given territory. People who believe in this doctrine cite the illustrations that during the early part of the Christian era and earlier many parts of Arabia and Palestine contained a larger amount of timber than now, and that the growth of timber could only have occurred with a more copious rainfall. The fact cannot be denied that timber was more abundant in those countries than now. But is the rainfall less now than formerly? This cannot be answered from established records for there are none at hand. Certainly from meteorological records which have been kept in this country and

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in Europe for over half a century, the indications are beyond a doubt that there has been no dimunition of the rainfall.

According to Ebermeyer,* the absolute humidity for the year in the air of a forest is scarcely greater than that in the air over open ground. But the relative humidity in the former case is about six per cent greater than the latter.

Fischbach states† that forests exert a beneficial influence on the equal distribution of rain. In the wooded regions it rains more frequently but the storms are not so severe. Formerly too much stress was laid on the forest as a factor in producing rain, but now the other extreme is taken.

The most important consideration in connection with the forest is the fact that the leaf mould and humble plants growing in the forest retain the moisture. The writer in a recent investigation of the Uintah Forest Reserve, has exploited some 860,000 acres, and from personal observations in many parts of the reserve there can be no question that the removal of forest trees and not permitting the young growth to take its place, the supply of water for the farmers along the various streams has greatly diminished. During the past season there was perpetual strife between different corporations or companies in regard to the amount of water that they were permitted to take out of the stream. In fact the water in the various streams was at a lower ebb than it had been for many years, and crops in many cases did not properly mature, owing to the lack of water. The cattle men and many of the farmers stated that this lack of water was due to the fact that sheep were permitted to range at will over the entire range, and as a consequence water could not be maintained. There was not the necessary leaf mould to hold the water and gradually release it. From personal observation the writer can say truthfully that in all those districts where the young or old forests remained that there was a perpetual supply of water. There were good springs everywhere along and through the forests. In places where the timber had been cut and proper reforestation had not occurred, the hills were bare and dry. Thus in the early days when the Union Pacific Railroad was constructed an immense quantity of timber was removed for railway ties. The timber was removed without regard to reforestation. In many places where there were once forests all that can be seen is an open park or in other cases the forest was burned. What was needed in this case was a proper forest supervision. The trees should never have been entirely removed, but seed-bearing trees should have remained to supply the seed for the younger generation to make its appearance. Young growing forests should never be herded with sheep and cattle as they commonly are because the herding of these animals is detrimental to the growing of trees.

I have had also some experience along forestry lines in Wisconsin. In western Wisconsin along the Mississippi and all of the smaller tributaries in that state, as well as those of southeastern Minnesota, there was a heavy growth of timber in former days. In many cases when the early settlers came they did not know what to do with the timber. It was removed and burned. The sidehills were removed of their timber and cultivated, and later they began to cultivate the ridges. Magnificent crops were obtained from eight to twelve years, then the crops began to decline. The soil was very badly washed, and so much so that the farmers had to abandon the cultivation of small grain and corn on those sidehills and turn it into grass

*Die Physikalischen Einwirkungen des Waldes auf heft u. Boden. 148.
†Lehrbuch d. Forstwissenschaft. 591.

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fields. The removal of forest trees has continued to this day and most of the ridges are now removed of their timber. While the grass meadows serve to hold to some extent the water, nevertheless, now there are great washes. During the spring the water rushes down and covers the fertile valleys below removing what little good soil remains. So that it is no longer possible in these low fertile valleys to grow small grain and corn. The rains too often inflict serious damage to farmers in these meadows. The water rushes off and in the course of a few hours along the smaller streams it reaches the bottoms and everything is under water. The springs have become less and less numerous owing to the continued removal of forests, and the streams now carry less water than formerly. It does seem to the writer that for a country situated as many portions of western Wisconsin and eastern Minnesota are that they should never be cultivated but should remain perpetual forests. Aside from the fact that the soil is being badly washed, the price of wood and lumber is continually rising in this country owing to the destruction of forests going on to-day. It does seem as though a more rational policy should be instituted.

In an investigation of the forest conditions in the Unitah Mountains I found that the general impression seems to prevail that the moisture during the summer is dependent almost entirely upon the snowfall during the winter. There is no question that this is a material factor in the amount of moisture that is released during the summer, and a few illustrations might be given to show this. During the winter of 1898 9 there was an unusual amount of snow in the entire Rocky Mountain region. In fact, there were many places in the Medicine Bow mountains as well as in the Wahsatch mountains where immense snow banks occurred as late as July 4th at an altitude of 9,000 feet. But during the winter of 1899-1900 the snowfall was so light that at these lower elevations it had long since disappeared, and snow only was coming from the banks at an elevation of between 10,500 and 11,000 feet. Now, it was a noticeable fact also that in the season of 1898 9 that the spring water coming from the brooks was also much more abundant. In fact, the woods and timber everywhere was moist, so that there is every reason to believe that the fall of snow and its retention in the forest is an important factor in the equable distribution of moisture during the summer, and it is as Fischbach states, more to the frozen upper surface, and that later this snow melts and percolates into the ground.

Prof. Sargent says:*

"Unfortunately, no observations of the flow of the great rivers in the United States have been made, covering a period of time of sufficient length to enable us to draw any conclusions in regard to it. But in Europe this subject has received more careful investigation. Herr Wex, at the recent yearly meeting of the Geographical Society of Vienna, demonstrated that the average level of the river Elbe had fallen seventeen inches; that of the Rhine, over twenty-four inches; that of the Vistula, twenty-six inches; and that of the Danube at Orsova, as much as fifty-five inches during the past fifty years. Accompanying this fall in level, there was also shown to be a constantly increasing diminution of the discharge of springs. Instances, though of less general importance, are not wanting near home.† 'There is a good illustra-

*A few suggestions on tree planting Separate from the Rep. Maine State Bd. of Agr., 1875.

†Trees of America. R U. Piper. Boston. 1855.

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tion of the effects of the destruction and reproduction of forests in drying up and restoring ponds in my immediate neighborhood. Within about one-half mile of my residence there is a pond upon which mills have been standing for a long time, dating back, I believe, to the first settlement of the town. These have been kept in constant operation until within about twenty or thirty years, when the supply of water began to fail. The pond owes its existence to a stream which has its source in the hills which stretch some miles to the south. Within the time mentioned, these hills, which were clothed with a dense forest, have been almost entirely stripped of trees, and to the wonder and loss of the mill-owners, the water in the pond has failed, except in the season of freshets, and what was never heard of before, the stream itself has been entirely dry. Within the last ten years a new growth of wood has sprung up on most of the land formerly occupied by the old forest, and now the water runs through the year, notwithstanding the great droughts of the last few years, going back from 1856.' ''

A few words in regard to the subject of forestry in this state. I never expect to see large portions of this state devoted to forestry for the reason that land is too valuable for agricultural purposes. Nor do I expect to find that the subject of forestry will, for many years to come, receive its due share of consideration in this state. Any one traveling in this state must have observed this fact, that the farmer who has one hundred and sixty acres of land, some of which was originally covered with a forest growth, tries to utilize every acre of it. Thus I have seen repeatedly in many districts of the state where magnificient growths of forest trees occur, are dying very rapidly, thus trees from a foot to two feet in diameter.

The forests are so closely pastured that the leaf covering is blown away and in many cases the roots have nothing but the bare ground. Of course trees will not properly thrive under such conditions.

Now there are areas in this state, however, that should be used for growing of forest trees. I refer to such places where cultivation cannot be carried on successfully, that is, where the soil is subject to washing. These places should be set aside and allowed to grow up with timber, and cattle should be rigidly excluded till the trees have attained the proper age.

However, the state can do something and is doing something, towards fostering the forest growth. The taxes on properly kept forests should be materially reduced, and the state might do something in establishing parks. Thus, for instance, the various meandered lakes in this state could properly be set aside as state reserves, and the surrounding land purchased for this purpose. Of course where the land is swampy, as it is in the lake region, forest trees will never properly grow, but on the surrounding area, which is always high and admirably suited for this purpose, trees do well. Originarally, too, they were covered with trees. These state forest reserves should be maintained, if for nothing else, for aesthetic purposes and as pleasure resorts. Of course it should be stated that the prairies are dotted with more forest trees than formerly, especially shade trees, and this forms no small item in the amount of area now covered by forest growth in this state. It is probable therefore, that the forest area has kept its own in this state.

Again the growing of small areas for the protection of stock or for the protection of orchards, the windbreaks, are quite extensive in this state.

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As to the question of private owners going into the growing of forests crops in this state as a commercial venture, it may be said that we have not reached that stage of development in the United States where the private individual can invest large sums of money to properly maintain a forest for considerable length of time. It is true that some persons in this state have successfully operated a tree planting for a considerable length of time and have obtained financial returns commensurate with the outlay of the money, but the tendency, as I have said heretofore, in this state is to not encourage that kind of work.

[NOTE. — The foregoing paper on forestry was read by Dr. L. H. Pammel before the department of agriculture, and was inserted here by request. SECRETARY.]

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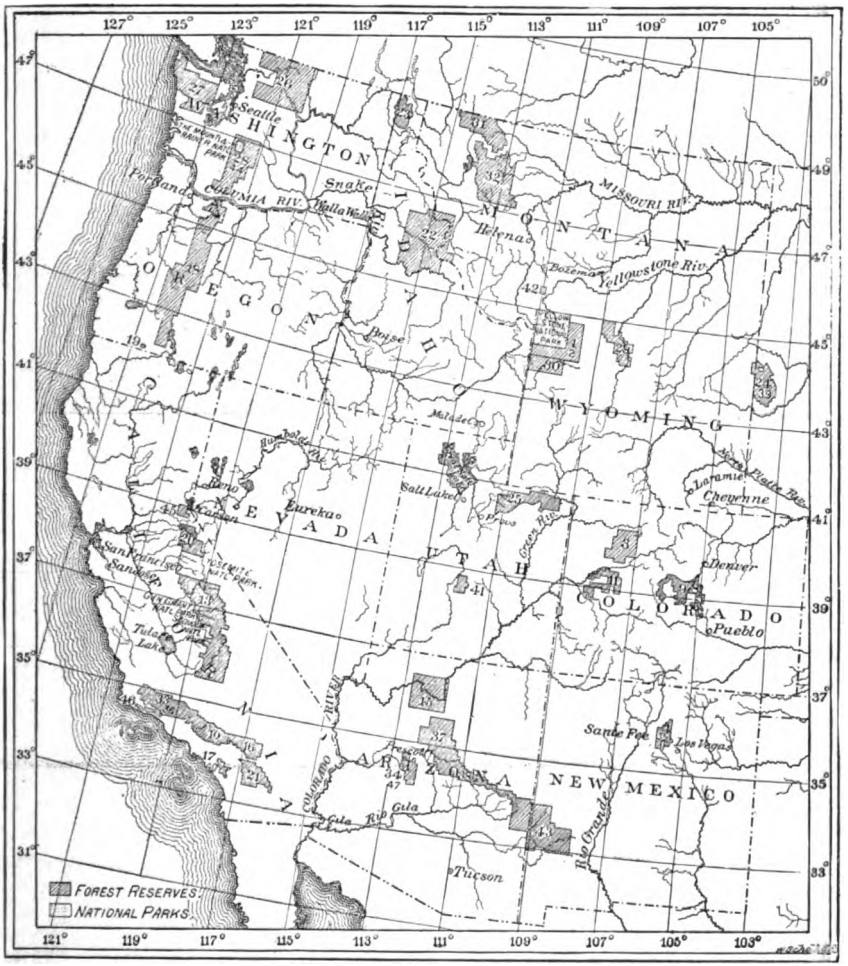

Forest reserves and national parks of the United States. More of these should be established. These forest reserves help to retain the moisture. Thus important in irrigation. Better laws for their protection should be established. Total area, 46,983,969 acres. (Pinchot, Bureau of Forestry. Year Book United States Department of Agriculture.)

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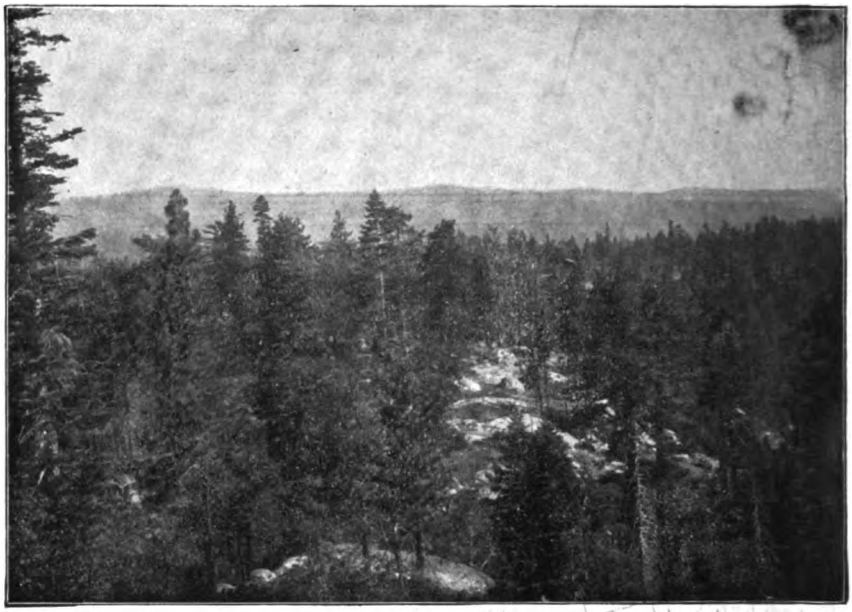
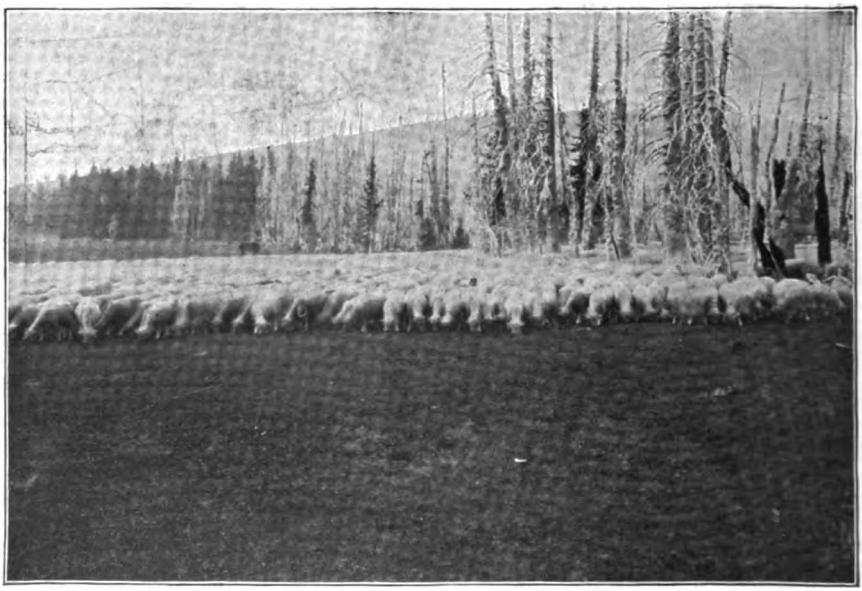


Stanislaus Forest Reserve, California. Forest trees chiefly yellow pine, mixed with white fir, sugar pine and incense cedar. (Pinchot, Bureau of Forestry. Year Book United States Department of Agriculture.)



Sheep grazing on Cascade Range Forest Reserve. The sheep have done a great deal of damage to the forests in various reserves, because the sheep men are indiscreet. The ground is frequently as bare as though a fire had swept through the forest. (Pinchot, Bureau of Forestry. Year Book 1897, United States Department of Agriculture.)

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Plantation of white pine, eighteen years old. South Orleans Barnstable, Mass. (Graves, Bureau of Forestry. Year Book United States Department of Agriculture.)

White pine grove in which thinning and pruning has taken place, Plymouth, Mass. (Graves, Bureau of Forestry. Year Book United States Department of Agriculture.)

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Forests should be properly managed. How often do we see trees cut without regard to the young growth. This illustration shows how the work is done at Biltmore, N. C. The young saplings are not injured. (Pinchot, Bureau of Forestry. Year Book United States Department of Agriculture.)

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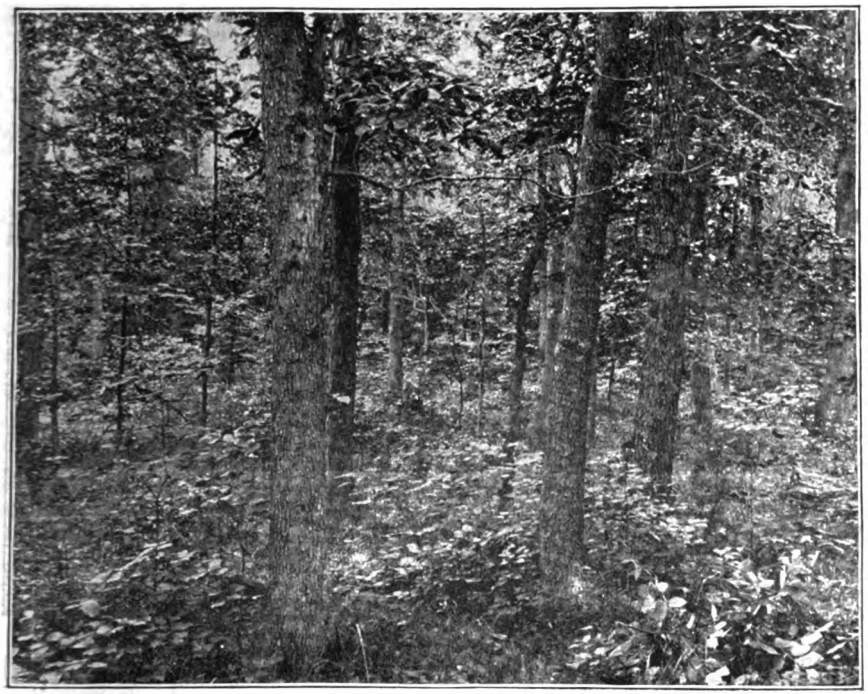
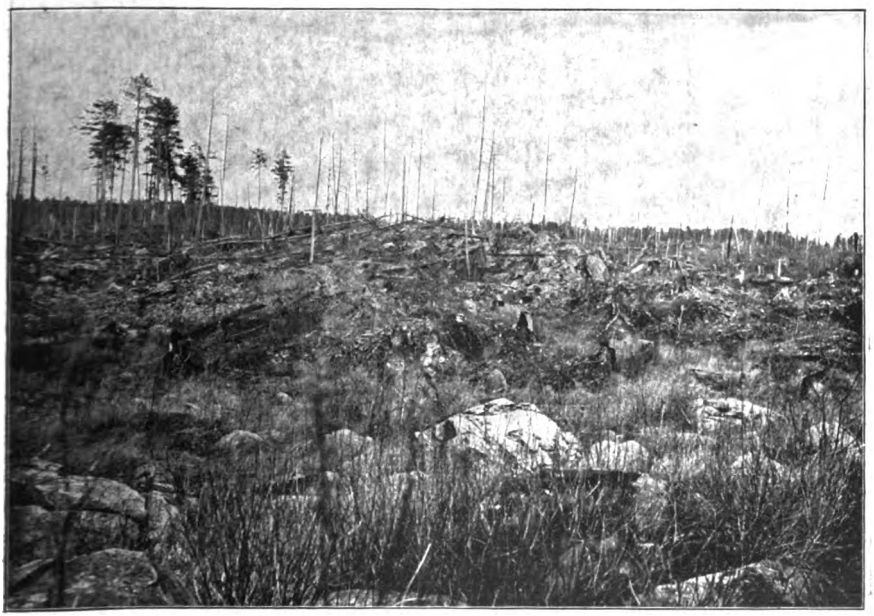


White oak, black oak and hickory, Oakland, N. J. (Graves, Bureau of Forestry. Year Book United States Department of Agriculture.)



Forest land in Minnesota devastated by fire. (Pinchot, Bureau of Forestry. Year Book United States Department of Agriculture.)

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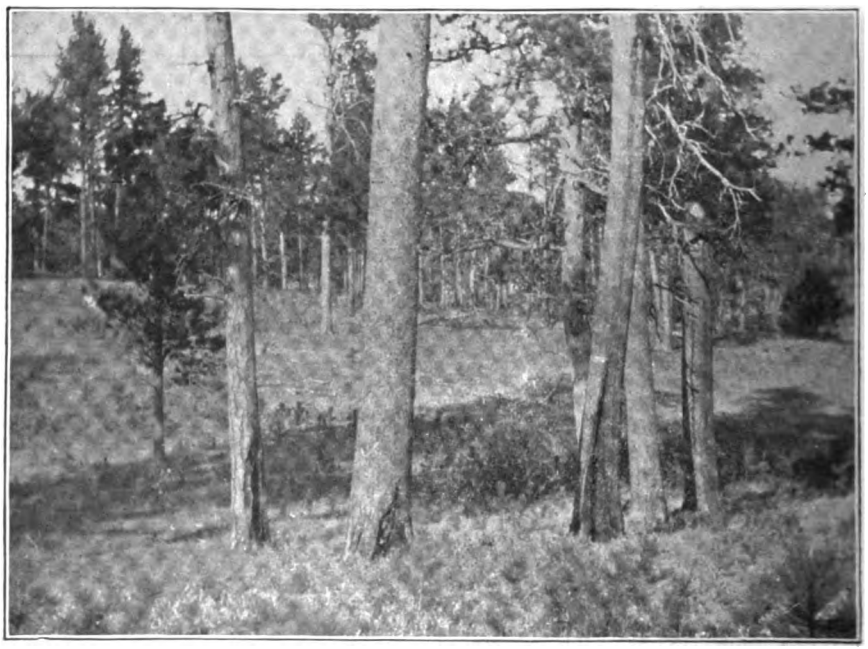
Here is another waste. Trees from forty to fifty years old are burned after the removal of the good lumber. No trees left for reseeding. (Pinchot, Bureau of Forestry. Year Book United States Department of Agriculture.)



Western yellow pine, showing fire scars at the base. These parks are fine grazing fields, but too frequently over-grazed. (Pinchot, Bureau of Forestry Year Book 1897, United States Department of Agriculture.)

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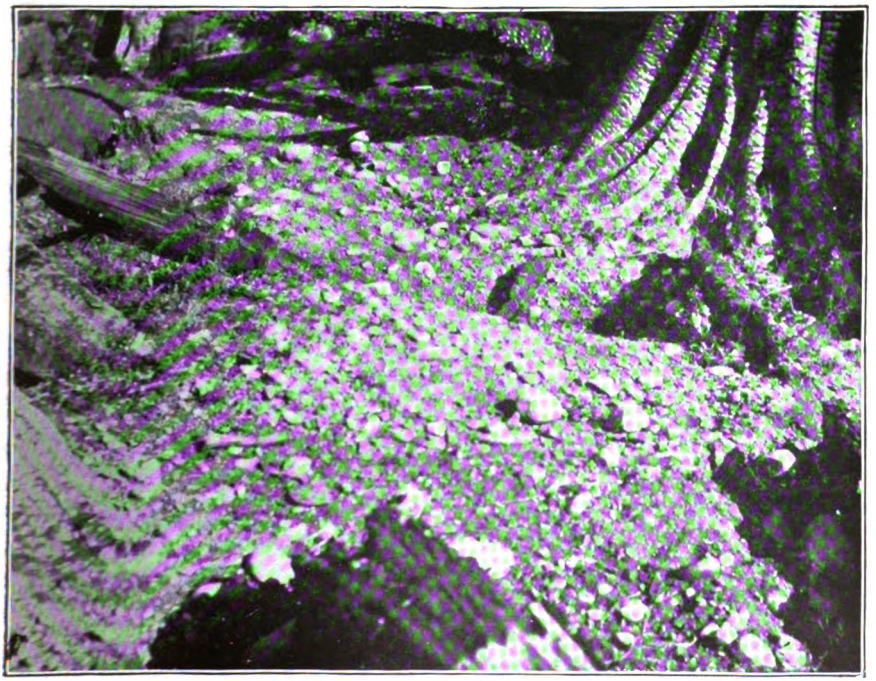
The roots of the western hemlock laid bare by the fire. Such soils do not hold moisture as they would if covered with humus. (Pinchot, Bureau of Forestry. Year Book 1897, United States Department of Agriculture.)



Charred fragments of Douglas fir. All of the humus burned. Such places will not support life for a long time. (Pinchot, Bureau of Forestry. Year Book 1897, United States Department of Agriculture.)

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Charred stub of Douglas fir with some young trees. It is nothing unusual to see thousands ot acres burned in this way. It takes more than a generation to replace this burned timber. (Pinchot, Bureau of Forestry, United States Department of Agriculture.)

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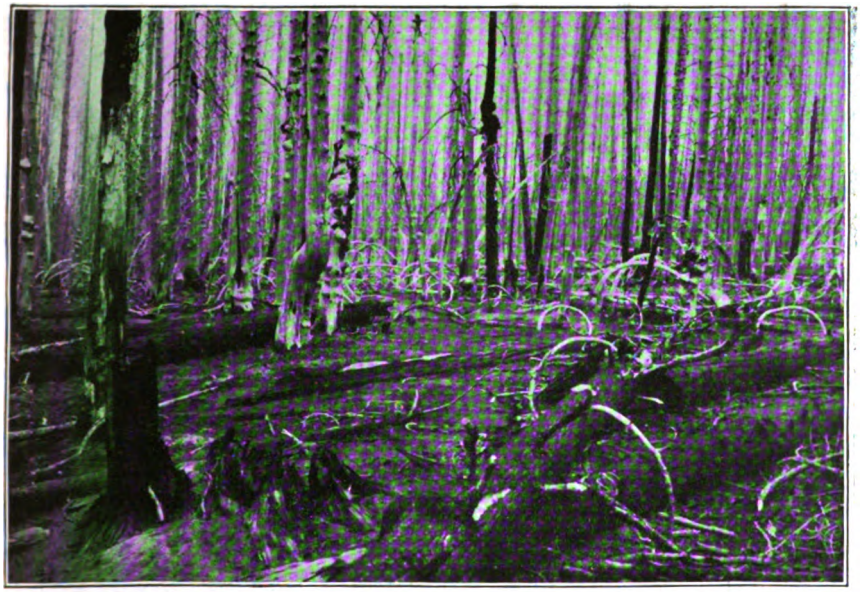

Forests in Cascades burned seven years before. No reproduction. (Pinchot, Bureau of Forestry. United States Department of Agriculture.)

Douglas fir. Fire riddled stubs and young trees grown since the fire. Olympic Forest Reserve, Washington. (Pinchot, Bureau of Forestry. Year Book United States Department of Agriculture.)

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How the farm is retained. (Fernow, Bureau of Forestry. Year Book United States Department of Agriculture.)

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How the farm is destroyed. (Fernow, Bureau of Forestry. United States Department of Agriculture.)

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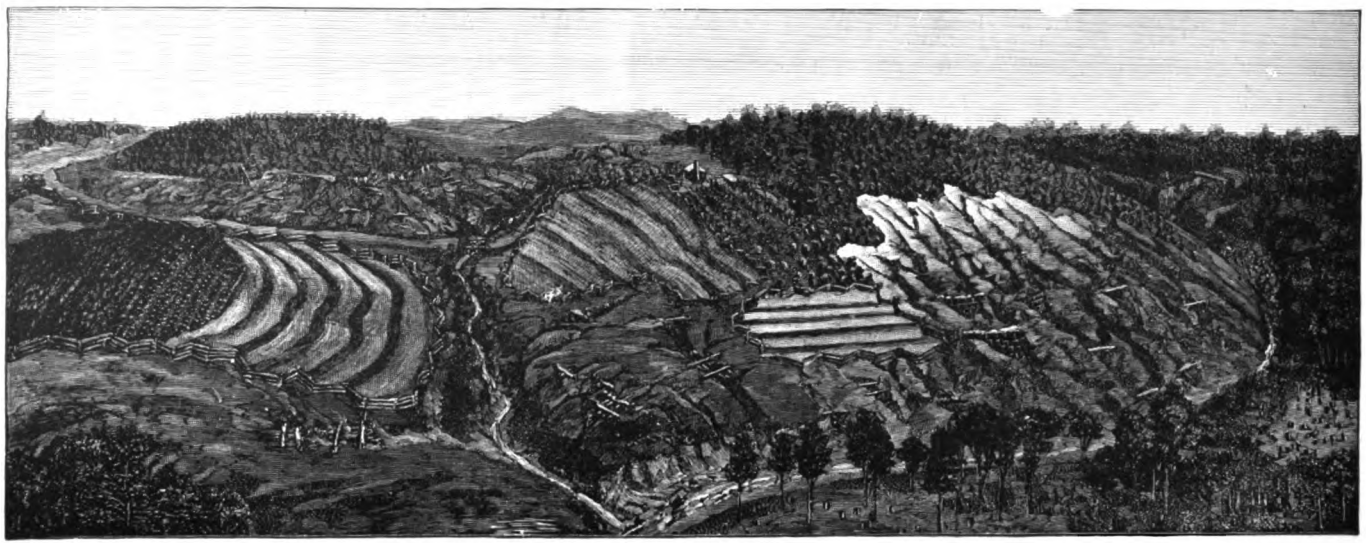

How the farm is regained. (Fernow, Bureau of Forestry. United States Department of Agriculture.)

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PROCEEDINGS

: : : OF THE : : :

SOUTHEASTERN IOWA HORTICULTURAL SOCIETY

: : : HELD AT : : :

MUSCATINE, IOWA, NOVEMBER 20, 21 AND 22, 1900.

THIRTY-FIRST ANNUAL SESSION.

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LIST OF OFFICERS FOR 1901.

PRESIDENT.

W. T. RICHEY.....Albia

VICE-PRESIDENT.

R. E. HINDS.....Ottumwa

SECRETARY.

C. W. BURTON.....Cedar Rapids

TREASURER.

F. O. HARRINGTON.....York Center

DIRECTORS.

First District—E. TATUM.....West Branch
Second District—WM. LANGHAM.....Cedar Rapids
Third District—A. BRANSON.....New Sharon
Fourth District—JOHN FORSTER.....Albia
Fifth District - C. G. BLODGETT.....Mt. Pleasant
Superintendent of Exhibits—H. H. MICHENER.....West Branch

Place of meeting, West Branch, November 19, 20 and 21, 1900.

STANDING COMMITTEE ON SEEDLING FRUITS.

A. Branson, New Sharon; C. L. Watrous, Des Moines; W. S. Fultz, Muscatine; W. T. Richey, Albia; Dr. A. B. Dennis, Cedar Rapids, and Sam'l Rowe, Oskaloosa.

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LIST OF MEMBERS.

LIFE MEMBERS.

Bills, F. L.....Davenport
Blodgett, C. G.....Mt. Pleasant
Branson, Abner.....New Sharon
Bruner, D. F.....Toledo
Dewey, S. B.....Washington
Forster, John.....Albia
Fultz, W. S.....Muscatine
Greene, Wesley.....Davenport
Harrington, F. O.....York Center
Harrington, Hugh.....Williamsburg
Harrington, Millard.....York Center
Hinds, R. E.....Ottumwa
Lathrop, H. W.....Iowa City
Michener, H. H.....West Branch
Porterfield, D. A.....Traer
Richey, W. T.....Albia
Russell, C. A.....Grantsburg, Wis.

HONORARY LIFE MEMBERS.

Diehl, M.....Washington
Goodspeed, M.....Washington

HONORARY MEMBERS.

Batterson, Miss Jennie.....Muscatine
Bryant, A. W.....Princeton, Ill.
Buffington, A. J.....Salem
Fultz, Frank L.....Muscatine
Guilford, W. H.....Dubuque
Handly, Jas.....Quincy, Ill.
Richman, Frank.....Muscatine
Shank, Daniel.....Clayton, Ill.
Thom, Wm.....Muscatine

ANNUAL MEMBERS.

Baker, J. B.....Washington
Brown, H. C.....Mt. Pleasant
Burton, C. W.....Cedar Rapids
Carr, E. R.....Muscatine
Dennis, Dr. A. B.....Cedar Rapids
Dewel, Chas. E.....Washington
Duckworth, W. A.....Keosauqua
Eden, Geo. W.....Lone Tree

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Elliott, I. N.....Mt. Pleasant
Fordyce, Edward.....Cedar Rapids
Garnes, C. H.....Muscatine
Gillis, J. R.....Mt. Pleasant
Hinkley, M. E.....Mt. Vernon
Hoopes, J. E.....Muscatine
Kemper, B.....Muscatine
Langham, Wm.....Cedar Rapids
Larimer, Robert L.....Cedar Rapids
Laughlin, J. L.....Mt. Pleasant
Lutton, T. J.....White Pigeon
Mason, W. H.....Cedar Rapids
Moore, Thos.....West Branch
Musser, P. M.....Muscatine
Roe, A. E.....Muscatine
Speer, D. B.....Blue Grass
Tatum, E.....West Branch
Townsend, O. L.....West Branch
Watrous, C. L.....Des Moines
Willard, W. O.....Grinnell

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PROCEEDINGS

OF THE

Thirty-First Annual Meeting

OF THE

SOUTHEASTERN IOWA HORTICULTURAL SOCIETY

HELD IN MUSCATINE NOVEMBER 20, 21 AND 22, 1900.

AFTERNOON SESSION—FIRST DAY.

Session opened with invocation by Mr. W. T. Richey, of Albia.

ADDRESS OF WELCOME.

BY FRANK RICHMAN, MUSCATINE.

I am at a loss to know what manner of people I am about to extend a welcome to, on account of a pleasantry perpetrated by the late, lamented, Mr. Bryan. He was accused of being a farmer. He said he was not a farmer —but an agriculturalist. He explained the distinction in this wise, a farmer makes money in the country to spend it in the town. But an agriculturist makes his money in town, and expends it in the country. And I have been wondering whether the same distinction should be made between gardeners and horticulturists and a great difficulty has presented itself to me when I attempt to define my own position by this rule. I live in the country, but practice a profession in town, and have not made enough money at either end of the proposition to be able to spend it very lavishly at the other.

But it is a pleasant duty, and an honor, to bid welcome to this association of horticulturists, collectively and to the members and guests individually. Our people are glad to entertain you, as a body or association, and proud of the distinction conferred upon our city by its selection as a place for your deliberation, and we feel well assured that, socially, many personal acquaintances will be formed between our citizens and stranger guests that will be both pleasant and profitable, and enduring friendships result.

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DISTINCTION MADE.

I take it the more obvious and practical distinction between the gardener and the horticulturist is this: that the mere gardener is, like the journeyman mechanic, too often the product of a mere apprenticship, and who has, or thinks he has 'learned the trade' while the horticulturist is one who recognizes that the true gardener is a scientist and that the science itself is like all true human science, ever progressive. All manner of learning may be made to contribute to the individual success and profit of the gardener, and the health, happiness and prosperity of the world that he feeds, is largly dependent upon him.

It is probably not an exaggeration to claim that, as an agricultural state Iowa is second to no state in the Union. Statistics will largely support the claim. That it does not relatively occupy so high a position, with respect to its horticultural products is due, largely, to the fact that until in recent years, for want of transportation facilities, there was no sufficient market. The older states that are more densely populated, have obtained an advantage in method by greater experience, and in the markets, by preoccupation of them, and I take it that the great object of your association is to meet and counsel together how best and most intelligently you shall meet this competition.

LOCAL PROGRESS.

Locally.—Here in Muscatine county, we have made a gratifying progress in some especial lines. Muscatine melons and sweet potatoes are raised in great quantities and at a profit. The products which are marketed at the Heinz Pickle Works, particularly cucumbers, tomatoes and cabbage, are grown each year in increasing quantities and as the secrets of success in these lines are gradually solved by our gardeners, they are beginning to realize that the great difference between success and failure is almost entirely in the "knowing how". My advice is to make these gardeners tell all they know. It will not be surprising if they have learned something from their experience which is not found in the books. On the other hand some one with less experience may have observed some fact that they have overlooked, and the theoretical and less experienced and practical man may suggest something new, and perhaps untried, that may be found of great practical utility.

WE KNOW LITTLE.

It is perhaps a little humilitating to fully realize that all we know, in most any of the sciences, bears about the same proportion to what we have yet to learn, as the finite to the infinite. But this is, undoubtedly part of the divine plan for the welfare and happiness of the world. If the mine of knowledge were likely to become exhausted we would easily become discouraged and disheartened.

And so, we not only welcome you as guests, but as teachers and pupils in a common school, where the scholars are all old enough to realize, or should be, that "learning is its own reward". And predicting for your body a successful and profitable meeting, and wishing for you all, the greatest of success in the callings which you follow, I will not trench longer on your patience.

We have the testimony of the Bible, (whether allegorical or otherwise) that when the Creator undertook to make a paradise for the first man and

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woman he created, he placed them in a garden. How they were to know enough to cultivate it, without eating of the forbidden fruit of the tree of knowledge, is not disclosed. Certain it now is, that the successful gardener must know something.

RESPONSE.

BY H. W. LATHROP, IOWA CITY.

It gives me great pleasure to respond to the address of welcome so generously and heartily extended to us. It is what I expected when I came. I have known the people of Muscatine and Muscatine county for a great number of years. Fifty-three years ago I met a generous welcome upon the banks of your river here. That generous welcome I have always retained. At a later day when the cars, the Rock Island road, first came in here, another generous welcome was extended to us. They took us into their homes, the Muscatine people did; they dined us, they banqueted us, and that generous welcome I have always remembered.

The state of Iowa owes a great deal to the early horticulturists of Muscatine. The patriarch of our society sleeps in Muscatine soil. If it were Decoration day it would be meet for every one of us to decorate the grave of Suel Foster with flowers. No man in the eastern part of Iowa ever did more in the early years of Iowa's history for horticulture than did Mr. Foster. He was the early promoter of this society. He longed for just such communion as we get here before our society was organized. He had gone into Illinois to their society to get it. He went to their meetings. There the suggestion came up, why cannot we in Iowa have a local society as well as in Illinois? Mr. Foster was there and he got the consent of some of the leading horticulturists there to come over and help us organize what we called the Eastern Iowa Horticultural Society. He brought with him such horticulturists of that day as Arthur Bryant and others that I might name. Mr. Bryant did not say that he would continue to attend our meetings as long as he lived and when he was gone would send his representative here, but we have to-day a representative with us, a descendant of Arthur Bryant, to meet with us, and we welcome him still more cordially on account of memories connected with his grandfather.

In early times perhaps your locality here shipped more apples than any other point on the river. It was before railroad days, and it was due to the early horticulturists. I think Dr. Weed planted a nursery here as early as 1838. Now the work of these early horticulturists is seen to-day. When that first nursery was planted the population of Iowa was a trifle over 40,000; to-day we are a people of more than two and one-half millions. Now the work of those early horticulturists, Mr. Foster being one of them, has extended over, I might say, the whole state. He was the man that introduced the Wealthy apple. He introduced the hardy Catalpa. His labors are here with us and if it were permitted persons from the realms of space to visit those on earth, there is no doubt but his spirit would be here and give us a hearty and generous welcome,—but I will not detain you longer.

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PRESIDENT'S ADDRESS.

BY W. S. FLUTZ, MUSCATINE.

Fellow members of the Southeastern Iowa Horticultural Society: We are convened here at the present time as an organic body representing one of Iowa's greatest industries that of fruit growing. We come together here leaving at home all personal rivalry or antagonism to meet in council and to exchange experiences and ideas, and to map out certain lines of action that may be conducive to the future welfare of the fruit growing industry of southeastern Iowa. No part of the great and prosperous state of Iowa has more need of a strong and vigorous fruit growers' organization than that represented by this society. While this society has been fully alive to the horticultural interests of this section of the state and has labored diligently to advance those interests, it is a lamentable fact that the fruit growers within our jurisdiction have been altogether too slow in assisting us in our work or in taking advantage of the benefit to be derived from an attendance at our annual meetings. In my opinion there should be a fruit growers' organization in every county within our jurisdiction and in fact within the state and that the state society through the district societies should encourage the formation of those county organizations by furnishing a limited number of the state reports to the members of these county societies without requiring them to charge one dollar dues per annum to their members. In many counties those societies could be carried on with less expense than one dollar per member, and experience has demonstrated that the membership of the state society has not been advanced by the present policy and it is evidently certain that it would not be injured by a more liberal policy, but that its membership and that of the district societies might be materially increased by increasing the interests that would be taken in horticulture through the aid of county societies.

ENCOURAGE SOCIETIES.

At the meeting of the society in 1896 the secretary in his report said: There are few if any live county societies in the state. There could be many if they had such encouragement from this society as their merits deserve. If the executive committee should be authorized to send one of their number or some suitable member to attend the organization and annual meetings of county societies it would be an easy matter to organize and keep them alive. The expense would be light but the benefit to the county societies would be great and the interests of horticulture would be greatly advanced. It is believed that suitable persons could be induced to go without any charge for time employed, merely rendering a bill for expenses incurred.

With the very limited means at the disposal of this society it would be impossible for it to inaugurate such line of work, but I would recommend that this society instruct its members whenever it is possible to do so to

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organize such societies in their own counties, and I would also recommend that this society designate ten of their number as a committee, any one or more of whom shall when called upon attend farmers' institutes in the interests of horticulture, provided that their expenses are paid by the institute. Of recent years this society has greatly enlarged its field of usefulness by holding its annual meetings in widely separated localities within its territory and has now got a list of members that represents almost every county therein, and every one of its directors is an active working member and resides in the district that he represents. This branching out of the society in its endeavors to reach and be of benefit to every part of its wide territory has increased its annual expenses to such an extent as to cramp it financially and the board of directors will have to devise some means whereby its revenue shall be increased or else its expenses curtailed and a curtailing of its expenses would, no doubt, mean a corresponding curtailing of its usefulness. Owing to the condition of the finances the executive committee in accordance with article four of the by-laws. have omitted a portion of the usual premium list, including the premium on flowers and vegetables.

In searching for a copy of our constitution and by-laws I found it necessary to go back to the published reports of 1880. So far as I am aware there has been no change made since then when this society was known as the Eastern Society. Owing to the fact that the name of the society has been changed since then and that we are now operating in a much enlarged territory, I would recommend that a committee be appointed to revise the constitution and by-laws and that the same be published with our proceedings.

FRUIT LIST REVISION.

Revising the fruit list.—At our last year's meeting there was no revision of the recommended fruit lists. This is a matter that is worthy of your consideration and should be attended to either by a committee or else by a vote by a showing of hands both ayes and nays being recorded upon each separate variety. Every farmer in southeastern Iowa has a claim on this society and has a right to look to us for guidance as to the varieties that can be most successfully planted. In assisting the farmers and others who wish to plant fruit trees we are getting far behind the state society which is securing a list of recommended varieties from some extensive fruit grower in every one of its twelve districts, and I would earnestly urge that the directors of this society be required to furnish a short list of the different varieties of fruit that are successfully raised in their districts.

In closing I wish to say to the members of this society that I thank you for the confidence reposed in me as your presiding officer and to assure you that I appreciate the honor conferred and at the close of this session I surrender back to you with many thanks the trust and honor conferred two years ago and I assure you that my associations with you as your presiding officer will linger in my thoughts as a cherished memory.

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SECRETARY'S REPORT.

BY C. W. BURTON, CEDAR RAPIDS.

Our directors will give you a detailed statement of the fruit harvests in Southeastern Iowa, of the season just closed, and also the condition and prospects of horticulture for the coming year. I hope and believe these reports will be full and reliable, coming as they will from experienced fruit men, living in the different sections of our district. It shall be my duty to condense these reports in order to avoid repetition, and yet give every important fact, contained in them for your instruction and guidance. I feel encouraged in the belief, that the citizens of this quarter of our state, who are engaged in growing fruits and vegetables, are becoming each succeeding year, more interested in our meetings, and though not in actual attendance, they read with great interest the papers and discussions that are published in the state reports of our proceedings.

The lessons which have been advertised on our programs for this and for the last three or for annual meetings, are designed to give the beginner practical information on the various details in the planting and the after management of the orchard, vinyard and garden. They have been conducted by teachers, who have had large experience in horticultural work and who have been well qualified to give instruction and answer questions on every subject pertaining thereto. It is for you to decide whether this feature shall be modified or discontinued.

I have tried to obtain reduced rates for our members every year for the last ten or twelve annual meetings, but have only been partially successful. The B., C. R. & N. R. R. is the only road that offers one and one-third rates without regard to numbers in attendance. The other roads will give this rate, only when at least 100 have attended these meetings and purchased tickets for passage on one or more roads, but the B., C. R. & N. R. R. offers the reduced rate to all of our meetings when held on their road. It may be well to remember this offer, when locating our future meetings.

We are greatly indebted to many of our older members for their continued interest in the welfare of this society. Some of them have been in constant attendance at its sessions for over twenty years, and have been at all times studying how best to promote its success. In fact the success it has attained is entirely due to their counsels and to their labors as teachers in the exercises at our annual meetings. Ought we not to show them by resolution or otherwise, our appreciation of their past labors in our behalf, and a slight acknowledgement of our indebtedness to them, by adding their names to our list of life members? Perhaps it might be made a new article in our constitution or an unwritten law of this society, that those members who have attended our annual meetings regularly for a certain number of years shall be entitled to life membership. I submit this thought for your consideration.

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I believe it advisable that we ask the State Horticultural Society for a larger appropriation in order that we may the more effectually accomplish the purposes for which this society was originally organized, namely, the dissemination of instruction, as to the best varieties of trees to plant and the best methods of cultivation, in order to secure the largest returns.

At every annual meeting of this society since I have had the honor of being its secretary, it has been my earnest endeavor to secure the attendance of ladies, who will take part in preparing papers and in discussing their contents. But so far I have uniformly met with very little encouragement; if in your wisdom you can devise some means of inducing them to take a greater interest in our work, you will greatly increase our membership and add largely to our success. These suggestions, relating to the good and welfare of our society, properly complete my report as secretary. But I ask your indulgence while I add a few disconnected thoughts on subjects pertaining more especially to horticulture.

Although we have not yet fully recovered from the wide-spread and nearly total destruction to our orchards and vinyards, of the winter of 1898, the results of the two seasons since, encourage the belief that in another year, as favorable as the last, they will have been almost, if not quite, restored to their former prosperous condition. I do not look upon such calamaties as wholly unmitigated evils. They may set us back a few years in our work, but they should teach us to study more carefully and obey more closely the laws that govern plant life in order that we may assist nature as far as possible in supplying every need and removing every obstacle to its best growth and development. If that disaster accomplishes this result it may work out in the future a more permanent and a more encouraging outlook for Iowa horticulture. Our climate, always variable and uncertain, although we may have fruitful seasons for many years, sooner or later there comes untoward summer, or winter, when all of the trees that are not entirely hardy, or thoroughly acclimated, will be cut off. The frequency of these test seasons should teach us to use better judgment in the selection of varieties and more care in their management and protection.

I am inclined to believe that we should not lay the blame for the disaster of '98 entirely to the extreme cold in that winter. If the wood, leaf, and fruit buds, and particularly the root growth, had been formed during the preceding summer, had been sufficiently matured, they might not have been killed, or materially injured by a temperature of even twenty-five or thirty degrees below zero. We often hear it stated as a favorable fact, that such and such varieties have survived a sudden and extreme cold, when the actual truth was these varieties had been so well prepared in their last season's growth as to go into winter quarters with their wood well ripened and their buds well clothed, and were therefore able to resist such severe tests. Is it not possible by frequent stirrings of the ground around the roots to stimulate the trees to do their work of growth early in the summer and use the remainder of the season in hardening and preparing this growth for a safe and undisturbed winter's rest? In addition to the few long tried ironclads that our society has recommended, I advise the planting freely of such varieties as have borne abundantly every season in a neighborhood orchard. The fact that a variety has proved valuable in a near by locality is the best proof that it will do equally well with you.

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Man possesses brain as well as muscle. The one to direct, the other to perform. By the use of both of these gifts he works out his salvation. Using muscle alone failure is most often the result. Failure, not only in horticulture, but in every avocation of life, is the certain result of ignorance and not obeying the dictates of reason and of laws. Nature works in the growth and development of plants, as in everything else, according to fixed and unchangeable laws. It is our duty and privilege to learn these laws and to assist rather than hinder in their execution. Our journey in life is a continuous battle with ignorance, and the temptation to disobey laws and to rush headlong without study. "The horticulturist should learn the composition of his soils and the best method of supplying wanting elements. He should learn what exposures and slopes are best and what care and cultivation is necessary to insure the largest returns.

In conclusion I will give an account of my experience in a contest with birds, and suggest a method of preventing their depredations. Like my friend Langham I am a lover of birds, and will suffer great loss before resorting to any extreme measures. I watch joyfully for their coming every spring and hear sorrowfully their farewell song when leaving in the fall. Before departure to the south, my especial pets, the robins, assembled in my front yard and either singly or in a chorus give me their last serenade. All of my birds during their summer's stay are nearly always a cheerful, friendly flock, deserving at all times of my love and admiration, and even when they have levied a heavy toll upon my crop of cherries I have tried hard to love and admire them still, to believe that I was always in their debt. From early morning until late evening they were constantly on the lookout for worms and fruit-destroying insects. So why should I begrudge them now and then a few cherries to serve as an extra course to their meal? But my experience in the last three years has tried my patience and love almost to the breaking. At cherry time, during this period my robins and blackbirds and woodpeckers and their friends from adjoining lots have preempted my back yard, where I have several nice cherry trees of various kinds and that ripen at different times. I estimate that each of these trees have born from a bushel and a half to two bushels of fruit each year for several seasons and that the birds have taken from one-third to one-half the crops. If my estimate is correct, it can be seen that my wish to pay the debt I owe them and my great love of fair play, has been quite expensive. Among my trees is an English Morello, which ripens so slowly and one at a time, that the birds swallow them down when they are in the red stage and before they are fully ripe and neither myself nor any member of my family ever get a taste. I imagine that from their experience with the Early and Late Richmonds, they have never learned what color this variety is when ripe. In this tree the cherries as they begin to turn are usually so few at any one time that the birds seem to quarrel among themselves, in their struggle to snatch them. But my patience and forbearance at last reached its limit. For unexpectedly one morning as I climbed my ladder to gather my cherries I found not only my birds but all their invited guests from the neighborhood around, congregated on the trees, feasting on the luscious fruit, and having a general good time. If I saved any of the crop there was no time to lose. So I expostulated with them, using mild words and gentle means, but without avail. I was at last compelled, like the old man in the fable, to resort to more

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forcible arguments, stones and clods of earth. I at last succeeded in driving them off, but they alighted on near by trees and filled the air with screechings, scoldings and most violent swear words. I understood their language perfectly without an interpreter. It ran thus: "What right have you to this fruit, you great hulking biped? Were not all of the trees and their flowers and their fruit created for our especial cheer and subsistence? We have watched over their growth from their infancy up. We have roosted in their branches by night and sang in them by day and have thus acquired a title by years of watchful care and until this present hour of peaceable possession." In spite, however, of such vigorous protestations, I controlled my naturally explosive temper and continued my task.

But this episode in my cherry experience induced me to cast about for some means of preventing any further tresspassing and of compelling my birds to seek other and just as heathful ways of satisfying their hunger, namely, a diet of worms. I tried various ways, but found that neither fluttering sails nor rattling windmills nor stuffed human effigies, were in the least effectual. The birds seemed endowed with too much sense to be frightened off by any such silly contrivances. They even gulped down my cherries under the very nose of a most threatening scarecrow. Fortunately at this juncture a neighbor who has a row of Early Richmonds near the line of my lot, had solved the problem and gave me an object lesson on the preservation of cherries from the depredation of birds. She provided thin cheese cloth covering for her trees, and spread them over just as the cherries were beginning to turn. It took from twenty-five to thirty yards for each tree, depending on the size. This cloth can be bought in Cedar Rapids for from three to five cents per yard by the bolt. The cost of sewing the breadths together and binding the edges would make the expense, in my opinion, not to exceed $1.50 per tree; now figuring that the birds took one-third of the crop, this protection would save, in every good cherry year, its cost, and as it will last, I think with care, for ten to fifteen years, I can see good reason for adopting the scheme.

I believe this same covering might be used also in the spring to save the blossoms from late frosts. It costs but little trouble to put it over and tie the corners to the lower branches and it can easily be removed when the danger from frosts has passed. I submit this method of saving our fruit for your consideration.

MEMBER: Do you suppose that muslin covering would keep off the boys?

W. S. FULTZ: You would find the Russian Mulberry a great protection.

C. G. BLODGETT: The stones you mentioned would do better to keep off the boys.

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SUMMARY OF DIRECTORS REPORTS.

The crop of apples in southeastern Iowa was considerably above the average, and where the trees had been properly sprayed were quite free from worms. The varieties reported as best were, as in former years, the Ben Davis, Willow Twig, Grimes Golden, Fameuse, Wealthy and Duchess, Several other varieties were also reported good, among them were the Jonathan, Annette and Jennett.

Of the small fruits, strawberries that had been mulched produced well. Cherries much above the average, especially the Early Richmond and English Morello. Raspberries also good, but blackberries were generally below the usual crop. Currants and gooseberries were badly damaged in northern counties by worms, but in southern localities produced about one-half an average crop. Peaches were quite good south of the middle of our district but not abundant in the north. The Bailey led the list.

On the whole we have every reason to be thankful that the last seasons' crop was as good as it was. The disaster of 1898 destroyed entirely, or greatly injured, nearly all trees and vines, and in the summer following they made only a sickly growth and though the winter of '99 was mild, the dry summer was not favorable for the full perfection of fruit buds, and so 1900 found orchards not prepared for a heavy crop of fruit.

CAUSES OF FAILURES.

BY JOHN FORSTER, ALBIA.

Failure is caused by disobeying laws which govern methods and principles. Failure is caused by the lack of judgement exercised at the right time. Failure is caused by being disappointed in our fellow men. The declaration of independence states these truths to be self evident; that all men are created equal, that they are endowed by their Creator with certain inalienable rights, that among these are life, liberty and pursuit of happiness. Again, it has been said we are not born equal; we are the result of heredity and environments, and some of us are endowed with a superior capacity for mental labor, for thinking out great problems, and that another is better qualified than we are to successfully execute them. We have failures in every avocation in life, when we peruse our local papers we would be disappointed if we did not see or hear of some one failing. Our local papers advertise that marriage is a failure, and our courts affirm it, caused by either breaking their vows or the law. We have bank failures caused by disobeying their rules and officers or employes becoming dishonest. The merchant fails in business by crediting too much to those who fail to meet their obliga-

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tions. The agriculturist fails not because he is dishonest, it is possible that he took up the other man's occupation, or by lack of judgment at the right time; by being too liberal in his purchases, his disbursements exceeding his receipts. The horticulturist has failed along with those of other avocations in life. They fail in preparing the ground and getting it in proper condition for trees or plants. They neglect to give them the proper attention and cultivation at the right time, They often set them out when the ground is wet and as the season advances the ground dries out, becomes hard, the earth by drying up shrinks away from the roots and the tree or vine finally dies. We often allow the borers to injure or kill the tree. Yet this does not prove that fruit growing is a failure. It simply proves that some one has failed to do his duty, or has missed his calling. It appears to be as natural to fail as for the wind to blow. We read in our bibles that the first man Adam was placed in the garden of Eden (we imagine) surrounded with all the varieties of fruit of that day and age, and was told that he might eat of all the fruit except of one tree, and he made a failure by disobeying the law. I must close these remarks and get nearer home.

The strawberry is the first fruit of the season, and one that should be protected, usually, we cover with straw. Even then there is an occasional failure of this delicious fruit. First by covering too heavy the vines are smothered, if not, when uncovered they are so tender that the bloom is easily killed. I have in mind three patches of strawberries, two of these produced a heavy crop of berries, large in size and fine in quality; the third one was almost a failure, what berries there was were knotty, scrawny things. All three were covered with straw. In conversation with a third party I learned that the bed was white as snow with bloom. I asked him what was the cause of this failure? His answer was, I don't know. We can control the time of blooming to some extent by removing the covering off our vines; to illustrate, if we want to have our vines bloom early we remove the straw from the vines by raking it into the walks between the rows. As long as the vines are covered (as a rule) they lay dormant, the covering protects them and prevents the frost from being thawed out. We had a cold, chilly rain at the time this patch was in full bloom; I imagine the pollen was beaten and blown off. In my judgment this is the principal cause of the fruit crop failure. We have in mind another cause of failure in connection with the one above named; the vines that are left exposed to the heat and cold are frequently lifted up out of the ground by freezing and thawing, the same as our clover is frequently killed. The bloom on the gooseberry, current, raspberry and blackberry is often killed, if not entirely so severely injured that the fruit is scarce, caused by sudden changes of the atmosphere. In fact we will include the bloom of the grape, apple, peach, pear, (these) all share alike by the sudden changes of the weather at some particular time, and when some of the varieties are not in the condition to endure such changes. We must acknowledge God is our Creator, and all He does is for our good, yet we must not fold our arms and do nothing. The average man is looking for wealth with the least possible expenditure of effort, but success does not come that way, on the other hand, failure is sure to follow.

God has created much for man's benefit and helps to prevent failures. The horticulturist, or rather the average fruit grower, has a hatred for birds. I claim tney are a blessing to the fruit grower. It has been said, they eat our

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cherries and berries, make holes in apples, which is true. The robins will knock the cherries off, the woodpecker digs holes in the red apples, and the owner in his rage will not pause to think of the many slugs and curculio those same birds have destroyed for him. All the year round the woodpeckers dig for the borers of various kinds that are killing our trees and spoiling our fruit. Professor Beal, in examining birds' stomachs, found in a single stomach of one of these birds three thousand ants. You can get a better idea of what birds are doing for fruit growers by reading S. B. Keffer's article on "Forestry and birds; their relation to horticulture," page 93, horticultural report for 1899. Kill the birds, do away with the fertilizer, avoid using the spray-pump and then you have the cause for your poor, inferior fruit. Disappointment causes failure. The average fruit grower depends on some one for his stock of trees or vines, as the case may be, so around comes the traveling tree peddler and you give him your order. Perhaps you will order Jonathan and you will get Wealthy; Ben Davis and you will get Sweet June, in after years. I gave an order once for low bush cranberry and got snowballs, and I did not have to wait five or six years to find out what I had either. Two bushes of the three bloomed the following season. You order one thing and get another, perhaps not intentionally on the part of the nurseryman, nevertheless it is caused by unreliable help.

Failure in plums.—Silas Wilson has said his experience and observation led him to the conclusion that one of the principal causes of failure in plum growing in Iowa, was on account of the methods of propagating. I have seen plum trees white with bloom and when the fruit would begin to set it would apparently die and drop off. We find our plums defective, stung by insects. A combination often causes failure. A large number of persons are as unconscious of their strong points as they are of their weak ones. A man or woman may be born with a strong talent or genius for some special line of work and yet be utterly unconscious of it. We often fail in business because we miss our calling. Jay Gould failed as a shoekeeper, Lannor as a surveyor and civil engineer before he discovered his bent in the railroad office. Wilson, the ornithologist, failed in five different professions before he found his place. Barnum tried fourteen different occupations before he ascertained that he was born for a showman. Josh Billings failed as a farmer and horticulturist and auctioneer, but found himself as much at home in comic literature as a fish in water.

W. H. LATHROP: Did I understand that that paper was written on the general topic of "Failures?" Now when this country was first settled up we all came from apple growing countries, from the Atlantic ocean through to the Mississippi. Some were from North Carolina and Virginia and other states down there. We came up here to make homes. Most of us as soon as we began to make homes began to make orchards. An orchard and a garden were the essentials of a happy home. We must have fruit. Nearly all who came here before 1850 were witnesses of a dismal failure in raising orchards. There was no fault on their part. From the time Iowa became a territory in 1838 up to 1850 we

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were going along as the saying is swimmingly, raising apple trees and peach trees. But 1855–6 came upon us, followed by 1856–7. These winters would freeze the tail off a brass monkey. Those winters showed of course that our orchards and trees could not stand such freezing as that. We had no bare ground then as we had in 1898. Our ground was pretty well covered with snow; but the trees went and they went almost universally. There were only a few left. Now it was just a question of adaptation to our climate. Our early settlers did not know what the climate was. They didn't study it. We have been studying it. We have been fifty years studying it. Now we have not met with any such adversity as they met with. For although the winter of 1898 was worse than 1856–7, it did not find us with such tender fruit trees. I think sometimes it is more the vicissitudes of climate that our failures result from than from carelessness in planting. There is probably a great deal in that, but it is largely this question of climate.

W. S. FULTZ: The failure of 1898 you know Father Lathrop was entirely different. In 1855–6 we lost on the top, but we lost on the bottom this time. The experience we had in those former years was of little or no benefit to us in these latter years. I don't care much about taking issue with Father Lathrop about failures but I have seen hundreds of wagon-loads of apples between 1850 and 1860 brought into Muscatine. They came in as potatoes come in now. In 1897 we had 150,000 bushels of apples; In 1898 six or seven hundred. We have not shipped any since. Hundreds of wagon-loads were sold in the markets of Muscatine, shipped to Cedar Rapids, Independence and to all the country. So I don't think we should say that our fathers made a failure in apple growing. I believe their orchards had paid before they went out.

M. E. HINKLEY: If you had had in 1856 the same varieties that we grow now, is it your opinion that we would have lost them?

W. S. FULTZ: Some we would, and some we would not. In 1883-4 and 1884-5 we lost Ben Davis. We didn't lose it in 1898. In 1898 we lost pretty nearly all our Willow Twigs and didn't lose the Ben Davis. We are still in the experimental stage.

A LITTLE HEAVEN ON EARTH, CONTINUED.

BY HENRY SHROEDER, SIGOURNEY.

Last year my customers here at home were so well pleased with the paper, "A Little Heaven on Earth," that I am glad to continue it with more proofs.

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Last May newspapers stated this: "A painter fell from the top of Eiffel tower at the Paris Exposition, a drop of 1,000 feet. A dispatch says that his body was reduced to pulp—Since the beginning of the work on the exposition grounds, 756 men have been crippled for life and 114 have been killed. All great enterprises seem to call for sacrifices of human life."

Now when you look into some catalogues and see the picture of Eiffel tower Mangelwurzel, it can easily mislead; like King Nebuchadnezzar, when in his dream he saw a tree growing high to heaven. But after he claimed, how and why he could build for himself the city of Babel, instead from tax and for taxpayers, then he sank so low that he ate grass like cattle for awhile. The same way some feel to native, for only native stock and themselves, while in union is more strength. Wouldn't it look foolish to you if in Europe they would hunger and not eat or plant potatoes, because they came from America? So in the horticultural part with a "little heaven on earth," we are not after such high trees and towers; we are for to live and let live, to improve our homes and like trees give good lessons, with their fruit true to name. In the spring trees make life enjoyable with flowers; in summer keep cool with shade; in fall feed with their fruit and in winter keep warm with wood for fire and windbreak. Even the grass how much nicer does it make our streets with blue grass and clover instead of weeds between the different street trees. If everyone would mow the weeds along his land early in June the grass would soon grow better and we should not need a weed law only for protection from grass thieves, as our Nebuchadnezzars who spoil good work along our lines for the public. This year 1900, I had some mowed along my ground four times and the oftener the nicer, and makes labor for some where the grass can pay them.

Now let me ask you if you do good for others with grass, trees and flowers, to give the public good lessons with a free show, which makes good healthy air, and you work for a good neighborhood; before selling any of your ground to a bad neighbor who is against horticulture for a big price, you would soon sell to a good neighbor for horticultural purposes for less money; is it then right to make you pay more tax for public. Don't it show a little heaven on earth when some nurseryman sends good stock to your home nursery? When the credit is good with any good nursery around the earth for anything to plant, fresh, not secondhand. When the customers like the five wise, had their lamps filled with oil, so they first order more nursery stock, where they offer you better prices to stay in business for them; so they refused traveling agents when offering them trees at 10 cents or less, which they sold to others for 50 cents. Isn't honest trade between nurseries and customers together, like Angel work? But those who don't order if they cannot get what they want they must blame themselves, like the foolish without oil, who went to borrow too late.

Now, though we have our meeting in November, we had better call more attention to May, as the time when farmers and horticulturalists have their busy time, and those not for it show themselves more for strikes and devilments. Let us bring more angel music for horticulture into our public schools, and you will soon find the truth from one angel to another striking together. Without being asked for it, last May our ex-superintendent of state, Henry Sabin, stated: "The school and the home must aid and support each other in the training of boys and girls. The boy who can smug-

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gle his vote into the ballot box before he is twenty-one, is considered well started on the road to become a good politician. The man who gets a vote dishonestly is just as much a thief as though he stole money from the pocket of the voter." And F. W. Zimmerman, a janitor for seven years in one of our schools, had this plain letter in one of our home newspapers:

"I do not intend to write an article which is seven years long, but I do want to say a few words of my seven years' experience as the janitor of the school. I have seen a great many nice little children when they started to school. I have seen their parents smile when that little darling went into the school room for the first time, and I say they have a right to do so. There is a long time between their first and last day of school.

"That little darling grew up under the care of the best and most qualified teachers of the county and state. So that we see, every year, some very respectable ladies and gentlemen graduating from our high school. But—here is the question—will all our children be ladies and gentlemen? Who are those that loaf in the schoolhouse yard night after night, chewing tobacco, smoking cigars, drinking whisky, breaking into our schoolhouse, filthing the sidewalks around the buildings, tearing up the neighbors' sidewalks, and for fun, during vacation, they shoot some innocent birds in the park, and letting the ball go through the window, which happened in one summer only six times, and that is $12 out of the purse of the taxpayers.

"But worst of all, who are those girls who are not afraid of such boys, but will go into those broken open doors with them, and that late in the night? To all those I say, you can't do the janitor as much harm as you do yourself.

"Dear parents, what will become of our next generation if we don't watch our children a little closer? Don't pay quite so much attention to your children's dresses if by some accident they should get spoiled. They can be restored by money, but no money can clean a filthy conscience and a dirty soul.

"Now, please ask yourself which in your city makes the best directors, Tom, Dick or Harry.

'When Arbor day comes Harry plants street trees and offers his children a premium to take care of them. Tom buys a ball for his to play on the streets. They tramp around and shake the trees loose and kill them, let the ball go over fences into their neighbors' garden or chicken yards, but he shows how to get over a locked gate first for the ball but after neighbors' fruit later. Dick orders and buys trees and plants, to be planted inside his ground where he has them safe from horse, cow and chickens. Tom uses even more street and alley ground for horses and cows, pigs and chickens, and his children instead of making trees and plants growing fruit, they loaf on streets along their neighbors' fences or even on horseback to make their long fingers longer. It takes too long before their neighbors' limbs grow fruit and flowers over fences. Bad temptations grow quicker. Their own homes show whether they are for a little heaven on earth or not."

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LESSON—SHADE TREES.

CONDUCTED BY WESLEY GREENE, DAVENPORT.

W. GREENE: We have four topics: Shade and ornamental trees, evergreens and shrubs. I suppose we should first take up the question of shade trees.

Mr. Willard what would you plant as a shade tree? Simply for shade without regard to ornament.

W. O. WILLARD: It depends on where you want it. If you want it in the street, a white elm or hard maple; if you want it inside, without regard to the appearance of the tree, box elder.

W. GREENE: Mr. Lathrop would you add to that?

H. W. LATHROP: I don,t know that I would add anything. If I wanted thick shade for stock, I would take the box elder. If any of you are in Iowa City at any time I will show you on our University campus my choice, white elm and maple, planted forty years ago last spring. We got the hard maple from Sugar Bottom, in the northern part of the county.

C. G. BLODGETT: I have in my yard, a very thick, nice shade from the catalpa. I think a great deal of the elm and hard maple, but not the box elder.

W. GREENE: The box elder makes a good shade, but is objectionable on account of its tendency to spread from the seed, which are easily scattered by the wind.

M. HARRINGTON: The elm is my preference.

F. O. HARRINGTON: I think in many places a soft maple is very valuable.

A. BRANSON: I would add the linn or basswood.

W. GREENE: That ought to be planted for shade. It is very dense. All trees have their limitations. I would not plant basswood where very dry, as it would not succeed.

M. HARRINGTON: Basswood has some faults. It grows up from the roots.

A. BRANSON: That is true while young, but when once formed and eight or ten inches through I don't think it does.

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WM. LANGHAM: I would put linn in place of box elder.

JOHN FORSTER: In certain locations I would add the walnut as a further variety.

W. GREENE: It is not very dense, but still it would give some shade. The oaks have been very much neglected, they are somewhat slower in growth than the trees that have been mentioned, but they are the enduring trees of the state, and should be more extensively planted. We have now reached a stage of horticultural development in this state when we should plant trees which are more permanent, so that as the years go by the rural homesteads will become more valuable on account of their trees, which no money could buy, but can only be secured through the slow processess of nature in growing them. Trees of rapid growth have been, and will continue to be useful where results are wanted in the least possible time. The cottonwood, willow and soft maple have served a good purpose in protecting the homes of the pioneers, but we are now past that stage, and should improve our places with a view to their future beauty and value. The objection to the cottonwood is the cotton from the seeds; this could have been prevented by planting only from cuttings of staminate trees. The Carolina poplar will be equally objectionable for the same reason; it is only a cultivated form of the common cottonwood, and differs in no essential features from it. There are a number of these cultivated forms of the cottonwood offered by the trade. The nomenclature of the poplars is quite confusing. According to Professor Sargent we have eight native species of poplars. The Quaking Asp (*P. tremuloides*); the Poplar or large aspen (*P. grandidentata*), these are northern trees; the Swamp or Black cottonwood, (*P. hetrophylla*) which grows from Missouri southward to the Gulf; the Balsam (*P. balsamifera*) which grows from Michigan northward, and of which the Balm-of-Gilead is only a cultivated form; the Narrow Leaved cottonwood of the western mountain region of Colorado, etc., (*P. angustifolia*); the Black or Balsam cottonwood of the northwest coast, through Oregon, Washington, etc., (*P. trichocarpa*) the Cottonwood of the Mississippi valley (*P. deltoides* of Marshall) or (*P. monilifera* of Aiton), and Fremont's cottonwood of the southwest coast. The Lombardy poplar from the Mediterranean region, Persia and the Himilayan mountains is a short lived tree with us. The Abele tree of northern Europe would be desirable if it were not for its tendency to spread so freely from the roots. Bolleana, from Russia, is much

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like the Abele, and the aspens of northern Europe resemble those in this country in growth and general characteristics.

C. W. BURTON: Is there any part of Iowa where the Lombardy poplar is successfully grown.

W. GREENE. I do not know of any. It does not live long in this climate.

C. G. BLODGETT: It was planted extensively in northern Illinois about forty years ago. About twenty-five years ago I went back there and found them nearly all gone.

M. E. HINKLEY: Will you please tell us where the Balm-of-Gilead is found?

W. GREENE: It is not known definitely where it can be found native. Ontario and Michigan were given as its habitat, but is only found, I believe, in cultivation, and is probably only a form of the Balsam with larger leaves. The Balsam grows from the lakes northward to Hudson Bay. Nearly all of the poplars are northern trees. The Quaking Asp is found from the Ohio river to the Yukon. The large aspen occupies nearly the same territory. The Balsam west of the Rocky mountains is nearly the same as the one east, only a larger tree. If you were planting for shade, and wanted to develop an individual tree, how close together would you plant them? Take an elm, for an example.

C. W. BURTON: Forty feet, for an elm.

W. GREENE: That is pretty close. The elm grows seventy to eighty feet high, and its branches spread as far.

C. L. WATROUS: Not quite so large as that, but I think forty feet not quite enough for an elm if on low, rich ground.

W. GREENE: I would plant white elms on good soil eighty feet apart, or the distance Mr. Burton mentioned and cut out every other tree later.

H. W. LATHROP: Would you ever cut off the top of an elm?

W. GREENE: I would on very small trees, to make them spread. I would not, as a rule, cut off elms. I would rather let them spread out in their natural way. Of course you can head back if you take them in time, and make very handsome trees of them. I think most people who cut trees back delay too long, and cut off too large limbs. If you want a thick round head of soft maple you must cut off while small. If you allow the branches to get large then cut them off, the stubs are sure to decay and the tree is doomed.

H. W. LATHROP: How high a body would you give for white elm? That is, to the lower branches from the ground?

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W. GREENE: That would depend on circumstances. As a rule I would train up to ten or twelve feet and then let it take care of itself.

H. W. LATHROP: I would carry them up fifteen feet.

F. O. HARRINGTON: Would not it be advisable to do this trimming while very small?

W. GREENE: I alway advise that. How would you protect the trunk of your tree?

H. W. LATHROP: I don't think the hardy elm needs any. Maples might need it.

W. GREENE: Yes, there are a number of trees that do.

C. W. BURTON: Would you not advise going to the edge of the forest for the trees?

W. GREENE: Certainly. I would take them from a clearing. Even the elm will injure in the bark, if set out from the thick forest.

H. W. LATHROP: What is the limit of the age of the hard maple when set out as a shade tree?

W. GREENE: We have not determined the age in Iowa. It is possible that under the conditions in which we grow our maples that they will not be very long lived. I think soil conditions are such that they may not live a great while. The great difficulty with all shade tress in cities is lack of moisture. Paving of streets, etc., carries all water away. Very little rain water ever gets to the roots of the trees. That is one of the causes of death. Gas, of course, is also very injurious.

A. BRANSON: There are some about a mile east of West Branch that have been planted at least about twenty-five years. Others near there have been planted thirty-five years. The leaves fall there and protect them.

H. W. LATHROP: Those trees have conditions that our shade trees in town do not have, because the leaves are raked up and burned.

A. BRANSON: Those in the ravines are larger than up on the hills.

C. G. BLODGETT: Near Denmark there is a row of hard maples nearly half a mile long. These seem to be doing very well. They make beautiful trees for ornamental purposes.

W. GREENE: What do you recommend as the best of our ornamental deciduous trees? There are some of them already mentioned, the elm and oak. I think they are pretty nearly as ornamental as we can have. Then the hickory, at certain

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seasons, add to the beauty of the plantation by its color. We have to consider another point, the surroundings. The oaks, while very ornamental, are not always desirable for the lawn, from the fact that they drop acorns, etc. When we plant for ornament we have to consider surroundings.

C. W. BURTON: The cut-leaved birch and Camperdow elm.

W. GREENE: Would you plant more than one or two cut-leaved birch trees near each other? It is a tree that shows to best advantage when planted as a specimen tree.

C. W. BURTON: They seem to be hardy with me. The limbs are close to the body, like Lombardy poplar.

W. GREENE: We have a weeping form which droops very nicely.

C. L. WATROUS: The Mountain ash is a handsome tree on the lawn.

W. GREENE: How many varieties are there?

C. L. WATROUS: I should name American and European. American fruits more than European, but it is not as handsome.

W. GREENE: Really the handsomest ornamental tree is the hard maple.

C. W BURTON: I put the hard maple ahead of all other trees, not only as a shade tree but as an ornamental tree, and I would trim it so that it would be symmetrical.

H. W. LATHROP: There is not a tree in our forest that grows naturally as symmetrical as the hard maple.

F. O. HARRINGTON: As to the hard maple, you must not send to points south of this for your trees. Southern trees are not hardy enough.

W. GREENE: That might perhaps apply to all trees. The nearer the native tree grows to where you are planting it the better for it.

C. L. WATROUS: That is the doctrine. We ought not to go way north any more than way south.

W. O. WILLARD: There is one that has not been mentioned, the American White ash.

W. GREENE: I think we ought to plant the common white birch in addition to the cut-leaved. It is quite ornamental.

C. L. WATROUS: I don't see what business the ash has on any lawn in Iowa. I don't think that it is ornamental, and it doesn't give much shade. The leaves are small and the bark is not handsome. It is a tree that I would plant for timber, but I don't see the use of planting on the lawn when you may have instead th

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birch, hard maple or linden. I would plant the soft maple rather than the ash, because it is not so thin in its foliage.

MR. GREENE: What of the Norway maple?

C. L. WATROUS: I sent a number of years ago and got a thousand of them. After a time I had one hundred; after further time I had four; now there is one.

W. GREENE: I think it is a little too dry for them here. East of this they seem to do fairly well.

C. L. WATROUS: Where they can be contented and happy it is certainly a very fine, beautiful tree. But I don't believe that the Norway Maple ought to be recommended in central and northern Iowa.

W. GREENE: I would not plant it west of Johnson county.

A. BRANSON: I have twelve or fifteen in Mahaska county that are doing well.

W. GREENE: I think, in the southeastern part of the state, as you have pretty good rainfall and humidity in the atmosphere that we have not in the center, you might succeed. But I don't believe they would succeed west of Des Moines. It is higher, and considerably dryer. They need moisture.

H. W. LATHROP: How about the linden?

W. GREENE: That is a very good ornamental tree, but there are some objections to the linden, except on large plantations, and also to the elm. Large trees want considerable space.

C. G. BLODGETT: A tree that has not been mentioned, and yet attracts considerable attention in Mt. Pleasant, is the Tulip tree.

C. L. WATROUS: It is not hardy enough at Des Moines:

F. O. HARRINTON: With me a Tulip tree fifty feet high killed out two years ago.

W. GREENE: The tulip tree is difficult to establish in western Iowa. After establishment it seems to stand fairly well. I think it is a little too tender for this section.

F. RICHMAN: I think that is the same tree that was sold to me for a magnolia a number of years ago. It is a very handsome tree.

C. L. WATROUS: The magnolia is hardy at Des Moinee. I have had it there a great many years, and after it is established once it seems to endure much better than the tulip.

W. GREENE: I think the magnolia, that is, the cucumber tree, (*M. acuminata*) will endure nearly all over the district.

C. W. BURTON: It grows with me, but I had one hundred tulips six to eight inches in diameter and forty feet high, that went out winter before last.

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W. GREENE: It is true we can hardly go by that winter. Even our red cedar, which is native, went out. We ought not to be deterred because we meet with losses of that kind.

F. O. HARRINGTON: I find while small they kill down. With me they killed down several winters to the snow line before I got them established.

W. GREENE: I think our best ornamental trees are the hard maple and white cut-leaved birch, buckeye and mountain ash. These would probably be classed as the leading ornamental trees for small places. For large places I would plant the elm for an ornamental tree. It is graceful, and a native. The linden and oaks should be included.

EVERGREENS.

If you were planting an evergreen, and simply wanted it for ornament, what would you select?

H. W. LATHROP: Norway spruce.

F. O. HARRINGTON: White pine.

W. O. WILLARD: I prefer White pine, but would take White spruce instead of Norway.

C. L. WATROUS: For a tree on the lawn we never had any other tree that has any business to go in the same class with Colorado Blue spruce.

W. GREENE: I think we ought to follow the name given by Sargent, and call it the *Picea Parryana*. There is quite a difference in all these in the coloring. If there is one thing that our experiment stations ought to do, it is to learn to propagate the Blue spruce in a more economical and easier way than from seed, so that we could propagate from the very best colored specimens.

C. L. WATROUS: I have been told that if you grafted the *Picea Pungens* or *Parryanna* and you didn't take your graft or scion from the top shoot that they would never grow upright. I think that that was the difficulty with Jackson Dawson. You must get a top shoot, and you can only get about one from a tree.

W. GREENE: There would be no difficulty in securing upright shoots.

F. O. HARRINGTON: That tree forms a great many center shoots.

WM. LANGHAM: What color is the Colorado Blue spruce?

W. GREENE: Silvery. It is a little brighter than the best colored of the White spruce, but is quite similar to it. Take a real good colored White spruce and it would perhaps deceive any one

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not an expert. An expert could tell it from the texture of the needles and general expression of the tree.

C. L. WATROUS: I am not saying anything against the Black Hill spruce, but when you plant them with the Blue spruce and have them growing several years, you can easily tell them apart.

W. GREENE: I have not had the Black Hills spruce long enough to know what color they will be here. Now, let us go on to the question of trees for windbreaks. What would you plant for a windbreak, of evergreens?

A. W. BRYANT: I would take Norway spruce. Either that or Arbor vitae.

W. GREENE: Arbor vitae would be my preference for a low wind-break, but for high one, I might differ as to Norway spruce. It has some faults. It loses its foliage on the windward side during dry winds, and when frozen the wind breaks them off. Right after a freeze you can see the whole lawn covered with needles. I would prefer the White spruce.

R. SHERBURNE: One time I planted forty or fifty Red cedars, and they soon made a nice windbreak.

C. L. WATROUS: If a man wanted a windbreak for a stockyard, or for any purpose where not in lawn, or too much in front, I don't know any tree for central Iowa that would excel the Austrian pine. It has long, thick leaves, and is stronger than Scotch pine. The wood is harder and tougher, and it makes a very thick foliage. If planted ten feet apart, in a short time it would be almost as thick as a stone wall.

W. GREENE: At Davenport I have one twenty-five rods long. It makes an excellent wind-break.

C. L. WATROUS: The trees are the most reliable of any evergreen that is grown about Des Moines.

M. E. HINKLEY: It is all right in the northwest, but it browns a little in the spring.

W. GREENE: In the eastern part, if not over the entire state, it is certainly to be preferred to Scotch pine.

H. W. LATHROP: In the northwestern part of the state I think the balsam fir would be the tree.

C. W. BURTON: Is it long lived?

Several members: No.

J. C. STUART: I would like to ask Mr. Sherburne whether he met with any loss in the last two years of Red cedar?

R. SHERBURNE: No, sir.

C. G. BLODGETT: More Red cedar died in Henry county, Des

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Moines and Lee counties, I think, than of all other evergreens put together.

H. W. LATHROP: Didn't Arbor vitae die equally?

C. G. BLODGETT: No, sir. As a living monument to some work I did about twenty-nine years ago in Burlington, there is an arbor vitae hedge there that is almost perfect. It is in good condition excepting in one corner, where water has stood.

W. S. FULTZ: Our Red cedar windbreaks have faded badly. The Arbor vitae hedge has stood it right along, but it is not high enough for a windbreak.

W. GREENE: I find that Arbor vitae on sandy soil is apt to go out from drouth. I think the Red cedar on sandy land will be more enduring than Arbor vitae; while on prairie soil Arbor vitae makes a finer hedge.

W. T. RICHEY: Doesn't the Red cedar color badly in the sun?

W. GREENE: Some specimens. There is a wonderful difference even in our native Red cedars. Some are a golden color all through the winter; others a bright green; some color a silvery tint; others will burn badly toward spring.

W. O. WILLARD: In regard to wind-breaks, if you were setting out a wind-break, how many rows would you plant, and the distance apart, and would you plant all of one variety?

W. GREENE: I would plant only one variety and only one row. I believe I can get more growth from a single row.

A. BRANSON: That has been my experience for years.

W. GREENE: The Austrian pine I planted twelve feet apart. It is a solid mass now. It is not very high yet, only twenty-five or thirty feet. While the pines are growing I would plant, say, willow, cottonwood, or anything that will make a quick growth, to be cut down when the evergreens are large enough.

W. O. WILLARD: If you put in two rows would you put in one of another kind?

W. GREENE: I never like to mix trees for that pvrpose. I prefer to plant all of one kind. If I were going into pines, I think Austrian makes the best protection. There is a gracefulness about White pine; it grows taller and is more ornamental than the Austrian. But for a close wind-break I think the Austrian is better. I have less confidence in the Scotch pine, and would not plant it.

Is there anything that you would recommend planting for ornamental purposes among the evergreens?

C. W. BURTON: Do you call the larch an evergreen?

W. GREENE: It belongs to the evergreen class. I think the

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European and American larches might do pretty well. One thing I like about the larch is its beautiful color in the spring. It is worth planting for that alone. It puts life into any landscape. I would plant a few of them, although I have not had much experience with it.

F. O. HARRINGTON: It is beautiful when the cones first appear.

M. E. HINKLEY: What experience has any one had with hemlock?

W. GREENE: I am fearful hemlock will not be successful in the greater portion of Iowa. It is too far from the humid atmosphere in which it thrives.

C. L. WATROUS: It is at Des Moines. I have trees about twenty feet high. This last freeze didn't seem to affect them at all.

W. GREENE: I was a little fearful that our climate was too dry for them. It is not the cold that will injnre them, it is the dry air. They succeed best east of the lakes.

F. O. HARRINGTON: I have one row. They are now twenty years old. One tree is twenty-eight years old. It stands entirely exposed. It has never shown the effects of winter and holds its color finely.

W. GREENE: Is it on a moist location?

F. O. HARRINTON: On clay sub-soil; not low soil.

C. W. BURTON: Would you recommend the planting of evergreens in lots in cities?

W. GREENE: As a rule evergreens are a failure in cities. One cause of failure is smoke, and another is lack of moisture. As a rule they are not desirable, except when they have more favorable conditions as when you can get them into a large sized park and protect with other trees.

C. L. WATROUS: In a town like Des Moines there is nothing that will save them, as there is a great deal of soft coal burned. But where I live there is no soft coal smoke.

H. W. LATHROP: At Iowa City our cemetery is beyond the reach of soft coal smoke, and yet evergreens planted are mostly going out.

W. GREENE: I don't know how long the white pine will live in this state. How long have they been planted?

H. W. LATHROP: Forty-five or fifty years.

C. G. BLODGETT: The white pine is one of the hardiest in the southern counties.

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H. W. LATHROP: I can give an instance where nearly a whole row of white pine went out, I think, from the white grub working on the roots. These trees were at least eight inches through.

W. GREENE: I frequently hear of cases of that kind.

What shrubs would you plant on the lawn?

H. H. MICHENER: I thing a rosebush is about as nice as anything if kept properly, also the lilac and snowball.

W. GREFNE: The rose bush does very well. My only objection is that it blooms so little, though it makes a grand showing for a short period, that it is not ornamental enough in foliage for a place on the lawn all the season through. The Rugosa is the best in foliage.

R. SHERBURNE: The Hydrangea.

W. GREFNE: That is a very good one. But it suffers a great deal from drouth through August.

R. SHERBURNE: It is worthy of a little care.

A. BRANSON: Where planted in a group or circle they protect one another.

W. GREENE: You can get a very nice effect by planting singly and taking care of it. For a time when it is in bloom, in August and September, it is one of the most showy things we have.

What would you add that blooms early?

M. E. HINKLEY: Weigela and lilacs.

C. W. BURTON: White lilac.

W. GREENE: Would any plant the Persian.

A. BRANSON: Yes, I should.

W. GREENE: I think lilacs should receive more attention than they have received, and should be raised in tree form.

C. W. BURTON: Don't they become a nuisance from sprouting?

W. GREENE: To some extent; but I have had several groups on the lawn for twenty years, and have never suffered much from that.

C. G. BLODGETT: I have a white one, but can hardly ever get any blossoms.

W. GREENE: The old common white doesn't bloom so freely as other varieties. I would not plant that when there are so many better. There are some of the newer whites that are quite free bloomers and very ornamental.

C. G. BLODGETT: The Spirea is a beautiful bloomer.

H. W. LATHROP: There is one thing that I wish to add, that is the Buffalo berry of the plains. They grow wild in Dakota. I don't know that anybody has propagated them.

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C. W. BURTON: Did you ever try the Smoke tree?

W. GREENE: It is quite desirable, but with me it has been a little uncertain, although it is usually considered hardy.

C. L. WATROUS: Is not the Spirea Van Houtte one of the finest? with its graceful, drooping sprays, and the Bridal Wreath —there is no spirea nearly so fine.

C. W. BURTON: It seems to me that there is one shrub that stands head and shoulders above all the rest—hybrid perpetual roses. It seems to me that the rose is the queen of flowers.

W. GREENE: That is true, but my objection to roses for planting on the lawn is that they are not very ornamental when not in bloom, and that is only for a short time.

C. L. WATROUS: I want to speak of some other shrubs that have been attracting my attention lately, and I don't think they are known and enjoyed as much as they ought to be. One of them is the Golden-Leaved Elder. It is one of the most striking and pleasing objects that I have ever had on my place in the line of shrubs. The foliage is of an exceedingly bright golden color, and its bloom is very white. It is a very striking and pleasing object and I do not see why it should not be grown a great deal more. Another thing is the Cut-Leaved Sumach. During all summer it looks like a bunch of ferns. You should have a little clump of these where you have a background of evergreens. Another thing is the Siberian Dogwood. The foliage is very handsome. It is handsome all summer and in winter the twigs are a bright red, and it is handsome then, especially against evergreens. I have wished that I had the power to get up some where and make a great noise and let everybody know how handsome they are and see if they would not try them. I believe it would be a distinct addition to our shrubs.

W. GREENE: In this district they are all sufficiently hardy. On our prairie soil they are all right, but you ought to plant them where they have a background of evergreens. The Cut-Leaved Shumach sprouts as badly as its plain brother. They are both ornamental, but spread so from the root.

C. W. BURTON: I would like to add the Wahoo, or burning bush.

C. L. WATROUS: It is perfectly hardy at Des Moines, and I would not be without it.

C. W. BURTON: The White Fringe I have had for a great many years, but the fringe does not last with me more than a few days.

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C. L. WATROUS: The Purple Fringe seems to get along very well.

W. GREENE: The flowers last a week with me. The tree is probably ten feet high.

F. O. HARRINGTON: I would like to add the bush honeysuckle. It is exceedingly beautiful. In the spring, through quite a long season, the blossoms are very pleasing. The leaf is beautiful and it is beautiful in shape.

W. GREENE: The Flowering Almond ought to go in and Prunus triloba.

H. W. LATHROP: How much space would you require to plant all these on?

W. GREENE: We ought to have an acre or more for every home lot. With only fifteen or twenty square feet, we could not plant many, but all these are desirable on lawns anywhere in our district. The Japan quince, with me, has been a failure. On the bluffs at Davenport it blooms handsomely, but with me I got only a few blossoms down near the ground, and they were very few at that. There are a number of good shrubs yet that have not been mentioned, but we must stop here.

C. W. BURTON: Before you stop I would like to know what proportion of a lot 60x140 feet, occupied in part by house and barn, you would put out to such shrubs and ornamental trees, and what proportion to tomatoes, onions, asparagus, etc.?

C. L. WATROUS: It depends entirely upon the soul of the man who lives there—the relative desires of his soul and his stomach.

EVENING SESSION—FIRST DAY.

SOME IDEAS OF HORTICULTURE.

BY SAMUEL ROWE, OSKALOOSA.

My paper in the horticulture report of 1899 has given me much satisfaction and encouragement. I am satisfied more than ever that I have the right principle when such men as C. L. Watrous, H. W. Lathrop, A. B. Dennis and W. S. Fultz wanted to have my paper suppressed, for the reason I advocate and do grow trees and grape vines in the sod successfully. Gentlemen, I invite you to my grounds in time of fruitage, as my trees and the fruit will be the best evidence of my practice. Close observation has convinced me that trees that never have been cultivated with the plough, the roots will run deeper than in cultivated ground. The cultivation of the ground forms more or less of a mulch; the mulch will draw the extending roots nearer to the sur-

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face just where nature does not intend them to be. I will give a practical test that any one can try. Put around any fruit tree or grape vine that has been planted one or two years and is growing nicely, five or six inches of sawdust twelve to fourteen feet in diameter around the tree and let it remain until it rots away, and you will find the roots very near, if not on top, of the ground. Try it. One more reason why the cultivation of fruit trees is wrong. The plow cuts off numerous roots that the tree (nature) has thrown up for a purpose in its existence. I am convinced every year more and more that sod is a valuable thing in an orchard. Clover is my preference, as it forms a covering, not only a part of the year, as recommended by many, but every day in the year. Remember, we are not in California, neither are we in Maine; we are in Iowa, and we have to do with Iowa, let the other places do as they please. One more idea, there is as much difference in growing a nursery and growing an orchard as there is between day and night. I have visited an orchard planted by a nursery man; the trees are planted about forty feet apart, each way, and trimmed up about five feet high, the ground is thoroughly cultivated each year. The trees are making a fair growth; they are six or seven years in orchard; have fruited but little. Sun Scald has attacked them and he has dug out a number of trees already. This orchard never can bear a large amount of fruit; it is like a cow's tail inverted brush end up. In this naked and isolated condition, when the hot summer sun and the cold winter blasts play upon these trees, roots and branches, it will be a surprise if the fruit pays the taxes and rent, and expense of gathering and marketing on the land on which they stand. One more, I presume a nursery should be cultivated similar to a corn field, the year the grafts are set. The roots are short and the cultivator does not destroy many of the roots, the second year the cultivator does destroy more of the roots, the broken roots will throw out two or more roots, which some people like; now, keep up this close cultivation for ten or fifteen years, tearing roots off, and it will not be hard to foretell the result, dead; some one says cultivate shallow, it will just lead to the same result. If I am spared, I will plant and grow an orchard on about this plan. I prefer clover sod. Dig the holes large enough to let the roots lay out straight; in planting the trees, when the hole is about one-third full, spade a circle around the hole four to six inches wide, and about four inches deep, and throw in the hole, and let it remain in this condition ten or fifteen days for the sun to warm up the roots and start the tree into life, and then fill the hole some more, and in fifteen or twenty days fill it up. If it should crack around the hole the bottom of the outside circle would be an obstruction, if not a preventive of the elements reaching the roots and destroying them. I would plant the trees closer north and south than east and west. Mulch the trees the latter part of June, or not until a dry spell sets in, with fresh stable manure, just to cover the hole nicely to keep it from drying out. The body of the tree should be about eighteen or twenty inches to the first limb. I cut the clover every year and take it off until the trees have fruited three or four years, and then cut five or six times with a mowing machine, during the summer, and let it remain on the ground, and continue this indefinitely. If the clover should die out, sow clover seed in early spring and harrow it thoroughly, and you will have no trouble in keeping clover in the orchard. I have sowed clover seed on stiff blue grass sod, in early spring, and it caught very good.

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I have only given a short outline of my ideas in this paper; I hope enough to be fairly understood.

H. W. LATHROP: About a week ago I got a newspaper from Oskaloosa, but could not find anything that I particularly wanted to see, until I had given it about the third examination I found an article by the editor. He referred to me as wanting to suppress this paper. I will say I want to express it, instead of sup pressing it, because I am carrying out the doctrines he advocates, and have been for many years; but there is one thing there that he fails to do that I am doing. I have not plowed my orchard for quite a while. My orchard was mostly set in 1865, but some in 1858. I plowed it and cultivated it, and once in a while abused it. The worst abuse I ever gave it was to sow a crop of Hungarian on it. My orchard was then sowed to clover. The clover stood about two years, but the blue grass kept coming in and has been there ever since. About every third year I gave that orchard a good, thorough coating of manure. An apple tree needs plenty of food. It don't matter much whether they get it with a spoon or a knife and fork, so that they get it, but they must have it. If I were going to plant another orchard I would raise them about like that, I would not put in Hungarian again, but would perhaps plow and cultivate until it got ready for bearing. Then I would seed it down and let it go in that way. I get two crops of hay in my orchard in a season. I take one crop off about the middle of June, the other about the first of September Sometimes I raise four or five crops on that ground. I have a crop of pasturage left there that I can get after the middle of November; then I get a crop of apples; when I cut out the dead limbs I have a crop of fire wood. That is the way I have been treating my orchard. In regard to seeding orchards down, there are two orchards almost within sight of mine, and about the same age. I never knew a load of manure to be carried on to them, and have rarely known them to be plowed, but I am quite certain that I get two bushels of apples to their one, and a lot better apples, too. They are on the same kind of soil. They starve their orchards and I give mine good food.

C. L. WATROUS: At a nurseryman's national meeting—I think it was in Indianapolis about three years ago, Professor Bailey of Cornell University, the foremost horticulturist of America, gave us a lecture about the treatment of our soil in nursery and orchard. He advocated plowing the ground until the trees had gotten their roots down into the ground where he wanted them to be. After

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that he would give them more shallow cultivation. Mr. Rowe, I believe, would not cultivate at any time. If he is right, Professor Bailey does not know much about it. I was in Professor Bailey's orchard a little more than a year ago. It had been planted some years, but the ground had been thoroughly cultivated; that was in the fore part of September. The last thing he does is to sow some kind of cover crop. If Mr Rowe is right, all of the best writers on orchard growing over the United States generally are wrong, because they generally teach that there is more fruit and better fruit in orchards that are cultivated. Now, as for wanting to suppress Mr. Rowe's paper, I am certain that he is entirely drawing on his imagination for that. I would not wish to suppress anything that any one wrote. If he thinks that his experience has warranted him in saying these things, and doubtless there is some truth in it, even though he goes counter to the best received doctrine of the most eminent horticulturists in the various states of this Union. I think he has a perfect right to defend his position, and I am very sorry that he thinks men in this society want to sit on him.

H. W. LATHROP: Mr. Rowe doesn't tell us how deep he would plant his apple trees. He ought to plant them deep enough so that he would not cut off the roots with the plow. That is what I would do. He speaks of their being about two feet in height to the first branches. Now, when he gets his horse and team in there he can at first plow tolerably close, but every once in awhile the single-tree will hit a tree. But when they spread out how is he going to plow, and when it gets to be ten years old the branches will reach out ten feet, how near can he get to the trees with a team then.

C. L. WATROUS: You can use one of those disc affairs that extends out a good ways.

A BRANSON: Mr. Watrous says that Professor Bailey may be right and the other wrong, but they may be both right. In New York state the probabilities are that the soil is pretty well worn out, and needs manure and cultivation, but that is different from the soil in Mahaska county; its soil is a black loam two feet deep, the very richest. Mr. Rowe's location is an old pasture that has not been used for a great many years. He may be right on that soil, and Professor Bailey right on New York soil.

W. T. RICHEY: We have in our part of the country two Germans. They have the two best orchards in the county. Their trees seem to be as old as ours, that have gone out. When I asked

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one of them, "How is it that your orchard is not failing?" he answered, "when I set my trees out at two years old, I sowed to timothy, later to clover, and later the blue grass came in, and the orchard has continued in blue grass ever since. I take out two crops of grass for two years and then I let it lie." The other orchard that I spoke of is the finest in the country. The owner is one of those men who never like to tell anything. I questioned him pretty closely. All that he would say was, "I know how to raise trees, and that is enough for me. I don't care about any one else knowing how." He cultivated for about two years and then put it to grass, and it is in grass today. The experience of these Germans will bear Mr. Rowe out.

W. S. FULTZ: I was pointed out as one who wished to suppress that paper. I expect I had better say a few words in regard to it. The facts are, that I practice keeping my orchards in grass. I do not advocate it openly because it is not fashionable. It is of very little use to discuss the question. My views coincide with Mr. Rowe's views. This is a matter of locality. We all know that Mr. Rowe has not been advocating grass in orchards as much as Mr. Tice has. He has been advocating it for years. In 1873 I planted my first orchard. I worked it until the trees began to bear, probably for six or seven years. Then I put it into timothy. In two or three years it ran into blue grass and remained in grass eight or ten years. I then took a notion I would make an experiment. I broke up the west two acres of my orchard. Mr. Rowe says cultivating would put roots deep and grass would not. I found roots right under the surface extending out twenty or thirty feet. It seemed that the ground was literally full of roots. I believe the grass brought the roots to the surface, while cultivation put them deeper. My center two acres remained in blue grass, only I sowed in timothy and harrowed, and put a good lot of manure on it. The east two acres were made a hog lot, and remained that way for ten years. I found there was not any particular difference in the three sections, only that I consider that I was getting a higher profit from the middle two acres because I was getting a crop of hay in addition to the apples. The second crop was allowed to go back into the ground. I never allow stock in my orchard. After I had worked it that way for ten years the west half was seeded down again, and it has remained in grass ever since. Now, that orchard is in good condition, except the east two acres that we pastured the hogs in. The freeze of a year

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ago last winter knocked that out, while the balance is in good condition to-day.

H. W. LATHROP: Too much hog.

W. S. FULTZ: Yes, if there had been a cover crop it would undoubtedly have been all right. I have not met a man but said I had the finest orchard in Muscatine. After coming into bearing I always seed down to grass. It is in grass now, except a couple of acres that are cultivated. It doesn't do any better than those in grass. I have generally cultivated in berry crops. I am surprised that Mr. Rowe said I wanted to suppress his paper when I have really practiced and advocated his plan.

F. O. HARRINGTON: I have been growing an orchard in grass. I have one that has been in grass for years. A portion I used as a hog pasture, but it is not pastured close and there are no hogs in it all summer, so that I lost no trees in the hard winter, with two or three exceptions. I have no doubt but Mr. Fultz's loss results from bare ground I do not consider that it is an argument against pasturing. I am convinced that cultivation is an advantage in the growing and maturing of fine apples. My trees have grown very much better, notwithstanding the hard winter, and notwithstanding that last year some of them did not grow at all until after the middle of August, when they had bridged over the injury done by the hard winter. In regard to the cultivating and injuring with the single-tree, I cultivate without a single tree.

W. GREENE: I suppose advocating grass is the popular thing to do, but I have some doubts about it being the best method. Probably ninety per cent. of the bearing orchards in Iowa are in grass, so that on the theory of general practice they have the question without further argument. We have lived through the lives of three orchards in the forty-five years we have been in the state, and have come to the conclusion that a blue grass sod should not have a place in an orchard if the owner expects to make any money out of the fruit growing in it. We are in favor of cultivating the soil, and growing crops between the rows, and continuing to do so until the shade from the trees prevent further profitable plant growth. Clover will put the soil in nearly as good condition as a sub-soil plow and is all right in the orchard for it will not form a sod to prevent rain water passing readily into the ground.

Our friends on the other side who believe in grass and mulches contend that that is Nature's method, and so it is, but she has no other implements for tillage but frost and water, and she sometimes plows deep furrows with them. However, Nature, unas-

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sisted by man, does not produce the best fruit, else the wild fruits would be better than those under cultivation, which you will not admit as true. That good fruit can and has been produced under the system of grass and mulches no one will dispute, but we believe the method is not consistent with the best practice and theory of tillage. A serious objection to grass and weeds are that they form a harbor for mice and rabbits and a hibernating place for insects. Borers, especially, delight to work in such places, for the grass furnishes a hiding place where they can deposit their eggs and the larva enter the tree unobserved. Neither am I an enthusiast on the cover crop question, or that it is the ideal thing for all of us to follow. Because we found a few trees that were killed in cultivated ground last year, and some in sod that were uninjured, we do not want to get stampeded and all run to the grass and weed theory. Because, if noses were counted you will find more bearing trees that are dead standing in sod than you will in well cultivated soil. And we are of the opinion that the man who ceases to cultivate will get knocked out on the market oftener than the other fellow.

SNAP SHOTS.

By William Langham, Cedar Rapids.

A Resolution. I want to present a resolution, it is this:

Resolved: That we request all the members of the board of directors of the Iowa State Horticultural Society, who reside within the bounds of the Southeastern Horticultural Society to use their influence to secure an annual appropriation of $200.00 for each one of the four district societies. I support the affirmative of this resolution. It is quite proper that the Southeastern Horticulture Society should take the initiative in this matter. She is the eldest child and daughter of the State Society. She resides in the oldest and most densely populated portion of the State and her wants and needs are perhaps greater than those of the younger members of the family, but she asks nothing for herself which she does not also ask for her sister societies.

The first inquiry to answer is: Can the State Society afford this generosity? I think so. She receives annually $2,500 from the State. The annual memberships probably swell the total to $2,700.00, and it must not be forgotten that this sum is not drawn on to publish the annual report, as that is done by the State gratuitously. At the last annual meeting of the State Society $300.00 was appropriated to make an Iowan Exhibit at the Paris Exposition, and I presume it will be in order to favor future expositions throughout the world in a similar manner. I mention this to show that the Society has more than enough money for all her customary and necessary expenses.

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Now to change the current of thought a little. Our State Society is a close corporation, so far as concerns the people at large. Of course, every one may attend, but its permanent location at the capitol makes attendance a hardship, or rather, an utter impossibility. At the last December meeting, which I had the pleasure of attending, fruitmen, commercial and amateur—the real genuine article—were extremely rare, only a few here and there, who, like myself, had come to seek wisdom at the feet of Gamaliel. And the ladies, the most I saw at any one session was four; the stenographer, two book agents, and a fourth one, who I think came in by mistake. Why, a horticultural meeting down in this quarter of the State without ladies would be a misnomer—an anomaly—a nondescript. It would be June without flowers, without birds, without sunshine. Do not think for a moment that I under-rate or disparage our State Society; on the contrary, I think it is a great organization, fulfilling a great mission in the development of the State. In its membership are numbered our best known and ablest fruit men, and, on all subjects horticultural, it is *ex cathedre*, the recognized authority. It edits and supervises the publication of the annual reports. It fosters and supports the various experiment stations throughout the state and keeps a watchful eye on that at Ames. All this and much more, yet it must be admitted that the four auxiliary societies are in closer touch with the people who do not only furnish the money but make legislators, as well, and, in my opinion, a generous treatment of these four district societies is expected by each general assembly when the annual appropriation is made to the State Society. There is not a meeting held by these societies which is not thronged with interested visitors. Their annual meetings are held at different localities each year, and thus the horticultural interests of all parts of the commonwealth are served. Our present annual appropriation of $150.00, together with the annual memberships, which with rigid economy, just about cover our necessary expenditures and premium list; with $50.00 additional we would be in easy circumstances, financially. And what good things this extra amount would bring us. No gold or silver medals, nor richly engraved diplomas would be sought, but in their stead we would be able to have at every annual meeting one or more of the best posted men and ablest talkers of our fraternity. You will agree with me that their presence is always desirable. Thanks to their generosity some of them are with us now. Again, we would always be able to secure a fair representation from the agricultural college at Ames. We must have men of learning and science at our annual gatherings. They are absolutely necessary. Entomology and Botany, for example, have much to do not only with the theory of horticulture, but especially with its practical workings, also. These college men are ever ready to give much general information and to answer many knotty and difficult questions appertaining to their respective departments of study, and thus often assist to advance the dignity as well as the usefulness of the society.

One season a strange bug made his appearance in considerable numbers at our place. This bug frequented the box elder, and, as winter came on, showed a strong predilection for hibernating in the various buildings, especially the dwelling house. The next fall I took a specimen with me to our society meeting, which I think was at Sigourney. Professor Osborn of Ames was there. After greeting him I says: "Professor, I have a bug which I want you to identify for me." "Have you it with you?" was his reply.

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"No, its in my grip, at the hotel," I answered. "Well, what kind of a looking fellow is he?" "He's quite a stylish looking bug," I says. "Rather dark in color, with wings edged and barred with red, and often with considerable red on the body. When full grown he is about three-quarters of an inch long and three-sixteenths wide, is as lively as a tree agent, and wants to board with us through cold weather." Laughing at my ignorance he says: "Why, thats the *Septocorus Trivittatus*, or box-elder tree bug. He was first found on the Missouri river and has ever since been moving east, instead of west, to grow up with the country."

Here it was, all in a nut shell. So far, I have not yet seen any particular damage which the *Septocorus Trivittatus* has done. If he would only destroy the box-elder, root and branch, I would look upon him as a blessing in disguise, and would be even disposed to overlook his abominable habit of wanting to winter in the house. And these professors are ornamental, too. The laity, the common people, gaze with wonder and almost reverential awe upon these learned men. Why, my dear friends, when I was quite a young man, still in my 20's, and held an honored position as instructor in one of our colleges, a good old minister, who was about to remove to Illinois, came to me for my photograph. "I want it," he said, "to show my people there. They want to see how our professors look." These kindly and sincere words, though time has left its silver imprint upon me, still woo my ears with the pleasure of other days. He got the photograph. And so, in all seriousness, I can say we must, if possible, have some of these college men with us at our annual meetings.

SOME ORCHARD PESTS, WITH SOME REMARKS ON A PEST NEW TO SCIENCE.

There are a few orchard pests, so common and so destructive, that even the fruit-grower, to his sorrow and cost, has been compelled to make their acquaintance in a greater or less degree, generally greater. If I were asked to designate the three worst of these pests, I would name the round-headed borer (*Saperda candida*), the plum curculio (*Conotrachelus nenuphar*), and the coddling moth (*Carpocapsa pomonella*). I firmly believe that in my section of the state, nine out of every ten apple trees which die between the second and eighth year after planting, are the victims of the rounded-headed borer. The depredations of this borer are usually charged up to the laziness and carelessness of the owner of the trees, but it often does its work so insiduously and effectively before detection that remedies are of no avail. The plum curculio is the great enemy of the fruit of the plum and cherry. Its puncture, in the shape of a crescent, is familiar to every one who has ever owned a plum tree, and has given to it the name of the "Little Turk." It has an especial penchant for the Domesticas, yet is not at all adverse to the natives. The injury done to cherries is less conspicuous, but nearly as great. I have sprayed plum trees for this pest with good results, I believe, using London Purple, or Paris green. I have never as yet sprayed cherry trees, but shall probably do so another year. The coddling moth is an importation from Europe. The larvae of this insect or moth gives us our wormy apples, and the damage in dollars, done yearly must be measured in millions. The arsenites are very effective in checking the ravages of this pest, and hold out hope for the orchardist in the future. While the tree pests above mentioned undoubtedly are at the head of the list, it must not be forgotten that the

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flat-headed borer, and plum gouger deserve favorable notice as easily holding *second* place. The mouse and the rabbit also, as orchard pests, deserve a special niche in the temple of fame, no not fame, but infamy. For I still have a painful remembrance how, one winter, the mice destroyed 170 fine cherry trees for me. And it would require three figures to express the number of apple trees and pear trees which, in years past, the friskey little cotton tail has girdled and ruined, albeit we usually keep a dog or two, and a small arsenal of breech loading and magazine shotguns for its especial benefit. I now come to the gist of this article. You will remember that the title at the head read thus: "Some orchard pests, with a few remarks on a pest new to science." In the very beginning I wish to say that this pest in reality is *not new*. It is as old as civilization itself, and has been, no doubt, often alluded to by writers on horticulture, and duly anathematized. I claim originality and priority in that I have given it a scientific name, and thus enrolled it on the scrolls in the rogues' gallery. While the borers, the curculio, and the coddling moth are exclusive in their habits, confining their ravages to certain trees or fruits, this pest of which I now particularly speak, is entirely cosmopolitan and omniferous, if you will allow this use of these two words. There is not a tree, or shrub, or vine in cultivation which is not subject to its attacks. Although in the aggregate, the injury done by any one of the three great pests named above, greatly exceed that done by this so-called new pest, yet the manner and character of its depredations are most aggravating, and never known it to get in its work on anything but the best. Your choicest tree, your most valued shrub, your rarest vine is always its victim. But I know you are waiting for a formal introduction to this enemy of the horticulturist. Without consulting the authorities of the State University at Iowa City, or asking the advice of the faculty of the Agricultural College at Ames, I have named this pest *Cingulatus Horribilissimus*, or the most terrible single-tree. This necessary little tool and a careless man make a bad combination. At our place as soon as I find this pest in the orchard I am always close at hand with paint, grafting wax, and bandages, to repair damages. I have never had but one man whom I could trust, and I have never let my confidence in him betray my discretion.

MY CASE STATED.

In the spring of 1899, as soon as I discovered that my vineyard was completely ruined by root killing, I at once ordered 900 No. 1, one year old vines for a new start. These 900 vines were made up as follows: 225 Concord, 225 Worden, 225 Moores' Early, 100 Wyoming Red, 50 Niagara, 50 Pocklington, 25 Agawam. The land selected for the new vineyard sloped gently to the east, while at the same time, about one-half slopes as gently to the north, and the other half to the south. The soil is what is known as timber soil, four to six inches of black dirt on top, and then a subsoil of yellow clay of unknown depth. This ground was put in the best possible condition with plow, disk, and drag.

The rows, eight feet apart, run north and south. The holes, eight feet apart in the row, were dug on an average, 2 feet long, 1½ wide, and from 12 to 15 inches deep, the rich black dirt being put in one pile, and the clay in another. Then, at a propitious time, just after a shower, we, in short order, set out the entire 900 vines, filling each hole with the best and richest dirt we

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could get, and you should have seen them grow. No vines ever received greater care or attention. With plow and hoe the ground was kept as clean and mellow as the choicest garden. Even in plain sight of my old vineyard, ragged, dying and dead, this new baby made my heart glad, and kindled anew in my breast the fires of hope which had burned low. Surely this little vineyard is a "thing of beauty," I said in my delight, but with the vision of the destruction of the preceding winter rising up before me like a grim specter, I added in a subdued tone, but will it be "a joy forever." In the autumn, when growth had ceased and the leaves had fallen, I went through with pruning shears, and shortened the new wood to three or four buds, and then placing over each plant a moderate covering of dirt, I tenderly consigned them to mother earth for safe keeping. In the following spring, that of 1900, at the proper time, I uncovered them, and was rejoiced to find the buds and wood in good condition. And how they responded to the vernal showers and life-giving sunshine of spring. Once again, in imagination, I walked through trellised rows of this magnificent fruit, feas ing my eyes on the beautiful and thick-set clusters, and in estacy breathing the aroma exhaled on every side, but in a few weeks I was alarmed to find that they had apparently ceased to grow. The new shoots, from one to four inches in length, had assumed a yellowish and sickly hue. With a spade and an aching heart I made a post-mortem examination, and it was even so, they were dead or surely dying in their infancy. The roots were dead, utterly dead, as in the spring of 1899. The buds in general commenced to grow with accustomed vigor, but when the sap in the tops was exhausted, the end came, 625 out of the 900 comprised the casualty list. The 275 survivors made only a very moderate growth, with foliage, however, of fair size and color, and I regard their chances of making good vines as about equal. The Worden fared much the best. The Concord was second, and the Pocklington third. Of the twenty-five Agawam, just one remained.

It sounds like irony on some of our pet theories to record the fact that the half of the vineyard which sloped to the north where we would naturally have expected the conditions to be the most favorable, suffered the greater damage, scarcely two score of plants escaping. In answer to an invitation from the genial secretary of the State Horticultural Society to be present at a special meeting to be held during the week of the state fair, and to favor them with a lesson on the grape, I wrote a somewhat lengthy letter, substantially embodying the facts as above stated, and after begging off from a personal attendance, I requested him to lay my statement before the members for their earnest and serious consideration. For in conclusion I wrote that I had set out the past spring—that of 1900—another and a larger vineyard, and among the varieties planted was 500 of Campbell's Early, and that I was anxious to learn how to carry my new plantation through the coming winter safely. Did I write that I was anxious? Why, I entreated and implored (by the shades of old Bacchus and all the Bacchantes, and) in the name of every grape-grower from Noah down to the present time, for some experience, for some information, for some hint that would guide me in my trouble. The secretary promised to lay my letter before the meeting (and no doubt did so) and said he would let me know the result. But I have never heard from him, and in the absence of definite knowledge, it is fair to assume that the members were entirely engrossed in considering such

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eminently practical subjects as "Southern Horticulture," "Fruit growing in the arid regions of the S. W.," "Ethics of Horticulture," "Chemistry in the orchard," "Prehistoric Iowa," with side lights on "Ice Ages" which once held sway in Iowa and other portions of the Northwest. Or such new and startling questions as: "Plant breeding," "Whole and piece root-grafts," "Is there such a thing as sun-scald?" "Is the tree vendor a necessary evil?" "Why trees lean towards the north or northwest," "Influence of the stock on the cion," "Is the Ben Davis an apple or a turnip?" "Do pumpkins and melons mix?" and of course, no time or attention could be given to such a trivial matter as mine. When quite a young boy, I distinctly remember a momentous question that was debated and re-debated at every lyceum and literary society. It enlisted the learning and eloquence of every one who had the gift of gab, and it seemed as though the fate of the republic hung on its proper solution. The question was this: "Which is the greater evil, a smoky chimney or a scolding wife?" So important as this question was, it was never settled satisfactorily in those days. Time, however, has done much to clear up the atmosphere. Modern skill and modern methods have about banished the smoky chimney from the land, but I thank God the scolding wife is still with us. Whether these "Ice ages" have had something to do with the root-killing of our trees and vines, should be inquired into by our scientists. I have my suspic ons of the Keewatin ice-sheet, or glacier (usually called the Iowan) which only about 100,000 or 200,000 years ago, emanated from the west of Hudson Bay, and pushed down into Iowa in a direct line for Muscatine, or rather the spot on which it stands. This particular ice-sheet, in defiance of the habits and ways of all previous and all subsequent ice-sheets suddenly, when in the vicinity of Cedar Rapids, abruptly changed its course almost directly eastward. Now whether Lathrop, of Johnson county, and Branson, then of Cedar county, instigated, of course, by Fultz, of Muscatine county, set up some stupendous barrier, and thus changed its direction, I have not been advised by the proper authorities, but it would be just like them to do so, especially if some great impending danger should threaten the horticultural interests of their respective localities. But to get back to solid ground. My experience with grapes planted in the spring of 1899, was not an isolated one by any means. Commencing in the northern part of Johnson county and extending across Linn into Benton, I know of quite a number who have had an experience similar to my own; some fared better, some worse. I have in mind one man who set out 100 vines and lost every one. Now ask what would you have done with my previous experience and a new vineyard on your hands? I'll tell you what I did. I pruned the vines and covered with earth just as I did before, but in addition I gave them a mulch of hay and straw. Did I do right? Will next spring bring me the garden of the Hesperides or the cemetery of blasted hopes and baffled ambition?

M. E. HINKLEY: I want to call on Secretary Greene to tell us what was done with Mr. Langham's question as to how to carry his new vineyard through the coming winter safely?

W. GREENE: I will say that in good faith to promise made Mr. Langham, I presented the question to the State Society, at the

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meeting on the State Fair grounds, and that it was under discussion for some time, but I must confess that after that discussion I do not believe any one present had arrived at a definite conclusion, or was able to give a satisfactory answer to the question. I wrote to Mr. Langham shortly afterward in regard to it, but it appears from his "snap shot" that the letter must have been killed on the wing, as it never arrived at Mr. Langham's domicile. I interviewed a number of the members afterwards and the concensus of opinion seemed to be that the injury resulted from drouth; in other words, the soil conditions were such that the roots could not resist the action of the frost, of the sudden changes in freezing and thawing which occurred when the subsoil was in the dry condition it was then and on the preceding winter. It was not the intense cold, for the thermometer had not marked as low a temperature in either winter as it had many other times when no damage was done. Mr. Langham's loss of vines was not an isolated case, for there has been more or less injury over the northeastern part of the state among grapes the past winter. If the dry subsoil is the cause of the injury it will not occur again until we have a drouth, such as we have lately experienced, and an absence of snow throughout the winter at the same time. I still believe that the injury of 1898-9 was due to the dry condition of the subsoil which permitted the frost to penetrate to a greater depth, and with more sudden changes of temperature than would have occurred had the subsoil been moist. There was considerable injury last winter, throughout the state, to raspberry and blackberry canes. It was, however, the usual top killing which occurs from alternate freezing and thawing during bright sunshine in winter.

MR. A. BRANSON: I lost about two dozen vines. Along about the New Year I was afraid that they might be damaged and went out with some sawdust and poured it around them. Those that had the most sawdust came through best, those with little sawdust went. I also covered my Crimson Ramblers and they came out all right.

W. GREENE: There is another thing I want to mention, which has caused a great deal of loss among young trees set last spring, and perhaps at other times. That is keeping trees in cellars or storage caves, many nurserymen to avoid the loss of trees by freezing, last year took up more than they could properly care for, or had them shipped from a distance, and they were too dry when planted. There were a great many complaints last summer

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of trees planted in the spring not beginning to grow until quite late in the season; some put out a few leaves and then stopped until mid-summer before growth commenced. The practice of keeping trees in cellars is a common one, but think the number of trees kept all winter out of the ground was greater last year than usual. Had these trees been buried a short time before they were planted, probably the loss would not have been so great.

SOME UNDESIRABLE IMPORTATIONS.

BY SILVAN PLUMLY, MUSCATINE.

A time there was when many corners of our globe were but little known and their people, products and animals were new and strange. Now in the day of steam and electricity when the earth is girdled with cables and steamships and it is less trouble and takes less time to go from here to the Orient than it did from New York to Chicago in the memory of living man, there are but few countries which have not been ramsacked in quest of plant or animal to further contribute to man's convenience in an economic sense.

Many things have been found of value and some things on the other hand have been introduced which have proven to be a positive curse. The Canada thistle is supposed to have been introduced in this country by British soldiers in their bedding from our neighboring province, hence its name. From the habit of spreading from root as well as seed it is a veritable pest. Many states have legislated upon its growth making it a crime to be allowed to grow and seed, but like too many of our laws this has not been enforced and it has grown on and spread till it is now common to a large part of our country. The Russian thistle owes its introduction here at a more recent date through the settlers from that country now living in Minnesota and Dakota. It has been left at Muscatine in bedding from stock cars until the tracks are lined with it, and we cannot but think that in time it will spread through the neighboring country. This grows utterly unlike any of the thistle family, more nearly resembling our tumble weed in its habit; like it it grows spherical, some specimens attaining a diameter of three feet. Like our tumble weed the roots are short and soon give way to autumn winds, thus allowing it to roll and scatter its seed over a wide area till its course is checked by some hedge or fence. While green and tender the plant might be eaten by sheep or other stock, but when dry it is a true thistle and is as disagreeable as its ranker cousins. Where it has obtained a good foothold I have heard instances where the labor and expense was greater in clearing the ground from its presence than in preparing the same ground for a crop. Bearing this in mind we doubt if one single thing can be said in its favor.

Another nuisance in perhaps a lesser degree is the prickly lettuce which seems to be quite common and to have been introduced all over this country at one time but a few years ago. I am led to believe it, perhaps due to cyclonic influences where possibly the seed was lifted up and carried a long distance which, when the force was spent, then allowed it to slowly sift down

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over a wide area of country. I have seen forest leaves in great numbers thus brought and deposited over a large area coming down, raining down, so to speak, out of a cloudless sky. Seeds, of course, must have accompanied the leaves. These disturbances in our upper air so largely started in our great southwestern country no doubt always existed, but now the soil being broken and thus rendered more easy to catch and germinate seed make this means of dissemination far more fruitful than half a century ago when this Mississippi valley was an unbroken prairie.

Another pest, the wild barley owes its introduction to the railway where it can be found growing first along some sidetrack having been given a lodgment in the bedding of some stockcar. Getting a foothold it will soon spread to adjoining meadows where in time it renders the hay unfit to cut as nothing can eat it, thus compelling the land to be plowed as a means of extermination. These are a few of the importations in the plant world which will grow and increase to vex our posterity, but more marked still are some in the animal world which from their more independent existence and rapid spread will prove a curse to our country. The foremost among these is the English sparrow which was imported and turned loose in northern New York in the hope that they might feed upon the caterpillars, moths and insects preying upon the foliage of the trees. Never was a greater mistake made for Pandora's fabled box was but a circumstance compared with this. Change and environment will very often produce a complete change of habit, and this proved too true for from being an insect-eating bird in their native clime here they are only a fruit and seed-eating one prone to scavenger tendencies. Being pugnacious in the extreme by sheer force of numbers they worry and harass our useful birds till they make their lives miserable and drive them from their accustomed haunts. Nothing so sadly needs the horticulturists' protection than our useful insect-eating birds, for between the boys' airgun, the demand for plumage on women's hats and the pesky sparrow they must grow less and less every year. All your kerosene emulsions, your Bordeaux mixture and Paris green solutions which of late years must be sprayed upon your trees to insure picking any marketable fruit, are due in a great measure to the decreasing number of insect-eating birds and the great increase of their enemies among which the sparrow plays no unimportant part.

I tried fruit raising here upon a suburban place for two years. The first one I sold $50.00 worth of grapes from a small vineyard which I put in shape to yield the same the succeeding year, but I reckoned without thought of the sparrow. They found them when they began ripening and on going out in the vineyard and making a noise at least fifty would be routed out from their despicable work of puncturing the skins to get one sip of the juice of the grape. I sold but $15.00 worth the last year and was compelled to charge $35.00 up to the imported pest and could not but wonder what sum did cover and will in the time to come their damage in the aggregate to the horticulturists of the United States.

Our native silk worm moth, the Cecropia, is no doubt familiar to many and attracted the notice of some French savant who conceived the idea of importing a few of the Gypsy moth and crossing the two in the hope of producing a hybrid of useful qualities. He had the half dozen specimens confined in a mosquito bar cage placed upon a window sill one day when a gust

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of wind upset it and gave them their liberty. Pandora and her box were again put to shame, for the careful reckoning of science has demonstrated that the unrestricted increase of a single pair of these Gypsy moths would in nine years suffice to strip the foliage from every tree in this country thus nearly if not altogether rendering it uninhabitable. Massachusetts alone we believe in one year appropriated a quarter of a million dollars to be expended in checking their increase and the singular spectacle was seen of a great commonwealth rising up in arms against a miserable little caterpillar.

The rabbit pest in Australia is known to all, a few English hares being imported and turned loose by an Englishman to provide him some sport. Here the warm climate being so favorable for their increase they have spread and multiplied till now they are a veritable pest and all growing crops must be fenced rabbit proof. Various plans have been tried to rid the country of them, even Pasteur endeavored to inoculate the cholera germs in them but to no avail for they are in such numbers that they are hunted in a wholesale way and their flesh canned and in this shape exported to the mother country. Our common rabbit is the nurserymans' worst pest and is perhaps now more plentiful than when our country was new; then their natural enemies, the wolf, fox, owl and hawk were more abundant and sufficed to keep down the rabbit family to a pretty low ebb. Now the domestic cat with the boy and his dog and gun are scarcely as destructive as were their first enemies, and the nurseryman as a matter of economy had best make his fences rabbit proof.

A new specie, the Belgian hare, is now being introduced. I read in California they are in such numbers in some of the breeding yards that they desire to turn them loose but the supervisors of some of the counties forbid it, being afraid they may prove a pest. So long as they are kept confined, no harm can come from them, but supposing they will in time get acclimated or crossed with our native species and get loose, there is a bare possibility of them proving a pest to the gardener and fruit grower.

Our common bat is a useful little creature, its food consisting of various nocturnal insects, but it remained for the Philippine Islands, our new acquisition, to show a giant fruit eating bat which for size and destructiveness, has no parallel in the animal world. These are five feet from tip to tip of wing and they frequently swoop down upon the banana and other tropical fruit plantations in their native country in such numbers that they both take all the fruit as well as break the branches from the trees. Without one redeeming thing to be said in their favor some one was criminal enough to import and turn some loose in rabbit-infested Australia and they have increased to such numbers that as a pest they are likely to rival bunnie. Some one imported a few in California, but before they could be turned loose the authorities promptly destroyed them and passed stringent laws against the bringing in of any such animals.

With the importation of noxious weeds upon the ground in our country, with the air being beaten by the pinions of the baneful flying fox in Australia and the wings of the miserable little sparrow here, there yet remains but one more agency which is possible of contamination and that is—the water. Has that been befouled too? We are sorry to say yes, yes. Never did our government make a more serious mistake than when they planted the spawn and young of the miserable German Carp in our streams. Their quick growth is the only thing which can be said in their favor. Vegetarian they can claim

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to be it is true for they will eat anything from a piece of rotten wood to a willow leaf, and roll around in the mud like a hog till their flesh is at times no better than the mud in which they disport themselves. But a few years since they were rare, now with their propensity for consuming the spawn of other fish they will equal if not outnumber all other kinds, and we are sorry to say that if this continues, as it must, they will in course of time be the sole occupant of our waters.

To stop and ruminate upon these things is not very cheering. Suppose the Gypsy moth will spread till it reaches the Mississippi Valley and a continual warfare must be kept up against them. Suppose the sparrows keep on increasing till they will consume all our grain and fruit. Suppose the detestable carp will in time be the only fish in our streams; these things are possibilities and if they prove true we cannot but help wondering if in that time to come that life will be worth the living for our decendants.

MORNING SESSION—SECOND DAY.

C. W. BURTON: I take pleasure in introducing to this society a delegate from the Northeastern Society, Mr. W. H. Guilford of Dubuque.

W. H. GUILFORD: I am very glad, indeed, that it is my privilege to be with you here in this particular part of the state, because I think your conditions and ours are almost identical. According to the maps published in our last report there is a possibility of our growing fruits of almost the same varieties as are found on the Mississippi bluffs here, and looking at the display of apples on your tables, and at what our people display up our way, I can see that you have many varieties that we have up there. I have no question but that the fruit grown in Iowa is as fine as is produced anywhere else in the world, particularly apples. There is in my mind no question about it. It is going to be one of the fruit countries of the future. Take our native plums. Every other fruit is as susceptible to changes and improvements as that has been, but because we have had about a dozen or so good faithful workers behind the plum in the last fifteen or twenty years we have made immense strides. One of our apples, the Willow Twig, does remarkably well in some places. It grows well around Dubuque, but the apples drop off and you cannot help it. I would rather raise a hundred bushels of Wealthy than to raise one bushel of good sound Willow Twigs. Yet there are parts of the state where the Willow Twig apple is successful.

C. W. BURTON: Mr. Lathrop told us yesterday that thirty-one years ago he and Mr. Suel Foster and three or four others, among

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them Mr. Arthur Bryant of Northern Illinois, formed this society. The enthusiasm and love of horticulture that was in the breast of Arthur Bryant, I hope and believe, has descended to his grandson A. W. Bryant, who is a delegate from the Northern Illinois Society, and is now present with us.

A. W. BRYANT: It gives me great pleasure, I am sure, to meet with the members of the Southeastern Iowa Horticultural Society, and I am doubly pleased to come here as a delegate from the Northern Illinois Society, and as a descendant of Arthur Bryant. We acknowledge that you have a great state, but I think it is no better than Illinois. We acknowledge that you can raise as fine fruit as we can in Illinois, but no better. We discuss over there the same problems that you discuss here, and we find the same troubles. We embrace a little more latitude than you do, but what is a problem in the northern part of Illinois is a problem in southern Iowa. I wish to take this opportunity to extend to all here a cordial invitation to attend the thirty-fourth annual convention of the Society of Northern Illinois, held at Yorkville, December 4th and 5th.

C. W. BURTON: It is a great honor to be president of the United States, or governor of this state, or to be even a great author, but I conceive it to be about as great an honor to be the father and author of a great apple. Mr. C. G. Patten of Charles City, is with us and he is the producer of just such an apple, Patten's Greening.

C. G. PATTEN: I hardly expected to be called upon for any remarks this morning and do not feel very much in the talking mood, so I shall not detain you long. Your secretary has referred to an apple of my production, and fearing that a wrong impression may be had in reference to it, or that I would willingly leave a wrong impression with the public in reference to it, I will say that apple has value, but like all other fruits, it has value along special lines of latitude and in special localities. I would hardly claim that that apple has value as far south as this in Iowa—still it might have, but it would only have by being marketed in the season in which it is developed here, because as you all know when you remove apples to a different latitude it changes their season. The Greening in latitude 42½ to 43, and north as far as St. Paul, has proven exceedingly valuable and is recognized as such, especially by northern people and Minnesota horticulturists. Now then, that fact is a pretty good text for any young horticulturist in this country, because it is just along that line of work of

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new production that our success for the future lies. I believe that the ambition of this society is to try to do something, and we can do no more for ourselves and for the future by working along lines of development in all our fruits than we can do in any testing of any varieties that we may secure from other portions of the world.

H. W. LATHROP: Mr. President, I will say to the delegates that we are very glad to have you here with us. You are members of the northwest as well as we. The northwest has been the infant of this country. It is getting to be—I won't say a great big boy—but it has just burst into vigorous young manhood. The northwest and the central west is going to make itself felt in our country, and we are engaged here in a branch of work that is to help build up this country. The unit of this society here is the home. I say it is the unit. The more loving homes you get in a community, the better that community and the higher that civilization is, and what is the home without good choice fruits? Go back to the time when the aborigines lived here. I imagine if we could see old Blackhawk here nibbling a wild crab-apple, and Teddy Roosevelt in there feasting on the choicest you have, you would see a contrast. You would see what our country is now compared with what it was.

PEACHES.

BY H. H. MICHENER, WEST BRANCH.

I get up here with some hesitancy this morning, in trying to instruct you on peaches, but Brother Tatum asked me to prepare something for the society, so I decided for my own benefit to talk a little on peaches. There is one problem that I would like to have solved for me; that is, how can we get a good peach equal in size to the Elberta, A 1 in quality and hardier than our present seedlings. I find several theories advocated, and one or two that have struck me most favorably are, that if we take the seedling peaches and set by themselves and have no other peach tree near, in a series of years by selecting the best among them we can at least secure a peach hardier and better and larger than the ones with which we began. I think the seedling, after a few generations, will adapt itself to our northern climate. It may take fifteen or twenty years to get something that will be A1 in quality, and not go out in our average winters. If anyone has anything to suggest I want him to tell what variety to use to bring this about in the quickest way. West Branch seems to be the home of the Bailey peach, or the Friday peach, as some name it. Dr. Bailey told me a few days ago, that out of twenty-one years he never had but three total failures from the five original trees. I would like this brought out, how can we get a better and hardier peach?

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PEACH AND PLUM IN SOUTHEASTERN IOWA.

BY GEO. W. EDEN, LONE TREE.

It seems that this peach question is not so delicate as some of our horticulturists would have us believe. Mr. Lathrop will tell you, in his fifty years of fruit-growing in Iowa, that had we given the peach the same attention we have the plum we would have at least a few more hardy varieties. He will tell you that he has seen home-grown fruit so plentiful as to sell at fifty cents per bushel. There seems at present a growing interest in the culture of all kinds of fruit that can be grown in Iowa. First of all have we a peach that will stand the changeable climate of Iowa? We can answer that question positively that we have the Bailey, a fruit that has been grown in Iowa since 1851, withstanding the winter without harm and has laid the foundation of successful peach culture farther north than was thought possible before its introduction. And now we have several varieties that are perfectly hardy. The Lone Tree seedling, which has been spoken of heretofore. Bent's seedling No. 2 is also a fine peach; tree eight and ten years old of this variety are found bearing fruit. There is a seedling peach tree growing in Washington county, planted during the 70's, that is in a good state of preservation; it bore some fruit in 1899. The crop of 1900 was full, average size of fruit eight inches, color creamy white with red cheek, similar to Champion, but a finer peach, ripens September 20th. At the Johnson county fair there were sixteen kinds shown, at Columbus Junction fair twelve kinds.

In regard to the plum. Dr. Dennis says the coming plum will be purely native, but while we are waiting for this native plum there are a few of the older kinds which may be planted with safety. There is the seedling of the Domestica type, originated in Louisa county, known as Brown's seedling. Tree fifteen years old, its regular bearing habit ought to recommended it, it is one of the finest trees you ever saw, the fruit is larger than Lombard, darker purple, the crop this year was seventy-five per cent., when all the natives were destroyed. The plums have never been known to rot on the trees. This is the plum that Mr. Silas Wilson says was the finest plum he ever saw. This tree is not propagated by anyone that I know of. We have a seedling of the De Soto plum, but a finer fruit, and nearly a freestone. It has a thin skin and is larger and does not overbear like its parent and others that have been spoken of heretofore.

A. BRANSON: In regard to Dr. Bailey's trees. He has only had those trees fifteen years. He got those Friday peach trees of me in the spring of 1885. They were then two years old. The first crop that he and I had was in 1889. The probabilities are

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that we have only had three failures since 1889. That is only eleven years—and that is pretty good. I had some peaches this year from a descendant of the original tree in Scott county on the Friday farm. There was no difference between those peaches and the peaches from trees twenty generations removed from the original trees. I understand those old trees went out that hard winter in 1898, being then over sixty years old.

R. SHERBURNE; I like the spirit in which Mr. Michener asks about producing peaches, though it seems to me he aims a little high. I for one will be contented with a little less and I believe that we all might be. We have great vicissitudes of climate to contend with. We may not be able to raise peaches as successfully as they are raised in more favorable localities, any more than we do plums. We don't raise the best plums in the world, but they are fine. Let us always strive for the best we can get. If we get a peach with good quality, hardy, and of fair size, what a great advantage it will be to farmers.

H. G. MICHENER: I am not contented with the peaches we have at the present time. I believe that we can get something better. We have to aim high, and if we fall short of the mark we can say it was not our fault. I hope we will get something before a great many years that we can depend upon.

C. L. WATROUS: Just right in connection with this subject I have something that I want to say to this society, because I believe it had better be said here than before any other society in the state, and it is about getting new plums and peaches and new fruits generally. It was my very great privilege to have a day with Professor Craig last summer over on the grounds of Mr. Williams, a man named Theo. Williams, just outside of Omaha at a little town called Bentz. He is a peculiar man. He has the reputation of being exclusive. The ordinary man gets nothing from him but cold looks and short words. People around there are not taken into his confidence. It is the most wonderful place, —if you can go there and get the man to be friendly—that it has ever been my privilege to visit. He has a quarter section of land and there are four hillsides, all sloping to one common point. There he has placed a dam across and made quite a little lake, which undoubtedly has some effect in keeping the air moist and giving fine conditions. The soil is an old lake, drained. There is quite a little sand in it so that it is warm. He has a great many hybrids, by the way, between the plum and the cherry. He is growing a great many seedlings there and not saying anything

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about it. He is not trying to make money by selling them. He doesn't want to sell them. In passing one particular tree he said that no one could get a twig of that short of a thousand dollars. His plan of work was what I wanted to bring out because it opened up a new field—a field that all of us can work in. He said in that plum orchard where he was getting these new things, there was scarcely a tree that had not from two to five sorts grafted or budded on it. His plan is to cut cions in growing time—any time when the bark is easily raised. Cut off a twig six, eight or ten inches or more, cut off leaves, make a long cut just on one side until it commences to break on the other side, fix it so that it is not too tender right at the point, then he goes to the tree and cuts across the top and takes this cion and forces it down two inches below the bottom of this cut, forces as far down as he can, so that there is under the bark a long space where the cion is cut down through the wood. He doesn't wax or tie, or take any pains. He does that any time in the summer when the bark peels. They call it bark grafting or twig budding. He could get fruit almost immediately from that, and then he plants the seed from these grafts. I have very good information from Burbank of California that this is his practice also. If, for instance, we are trying our wild grape or native apple, the first cross is made carefully by hand, and after we have some hybrids, say of our native apples, sufficiently large to afford cions, instead of waiting for the trees to grow, we cut them off and make as many grafts as possible. That particular way of bark grafting is so easy and simple that anybody could do it. Some little boy six or eight years old did the most of it for him. With peaches take two that seem to combine certain qualities that we want, as hardiness and great size, or take one that has that, and one that has an especially good quality and get twigs from that and put them in in this way. This society can do it better than any other society in the northwest, because we have a more favorable climate here than further north and further west and we have a great number of varieties all here ready to work with. This society is practically free from bias. It is not as badly ridden with the Russian fallacy as a great many others. I have here a list of some of those sorts: The Goosedye is one of Mr. Williams' new creations,—Wild Goose plum and Dyehouse cherry; the Fosowattomie, of these he has fruit in their perfection. These were actually grown by a man in Maryland. I think there is no one else who is doing as good work as this man Williams.

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There is a man in Texas who is doing the same thing for native American grapes. With the knowledge of his methods, there are great possibilities opened for us here, He has this theory. He says that if you want to get a plum or cherry, or any other fruit to be especially early, then you must take seeds of the very first specimens that ripen. If you want to get a strain of those that will ripen late, you must take seeds from specimens that hung the very longest on the tree. Any one can do that. Then another thing, he says if you want to get good results from your trees you must take the very best care of them If we follow out those lines there is no limit to the possibilities opened, and they are open to everybody.

MR. GUILFORD: I have had a great deal of correspondence with Mr. Williams. He has sent me scions, among others the Fosowattomie. He explained to me that the fruit was so brilliant a red that he never could get it; the birds took it. He is doing a wonderful work.

E. TATUM: I just want to call attention to one thought that the speaker brought out regarding the Bailey peach. He spoke of it as being without injury. I think the trees without injury were very scattering. Indeed Mr. Bailey's trees of bearing size nearly all died. Mine did also. Out of forty or fifty in two or three rows there were only two that survived the winter. I don't think Mr. Bailey had more than one out of forty or fifty but was almost entirely killed. He had smaller trees coming on that were not killed.

C. G. PATTEN: I would not think of taking your time just for the present did I not regard this as the most important field of labor that the horticulturists of this great country have before us, especially this great western country. There is so much to be said upon this question. While Mr. Michener was speaking I felt as though I wanted to encourage that young man to proceed with his work, and I want to say to him and to every other young man that you cannot aim too high. The possibilities for improvement in our fruits are almost unlimited. One thought occurred to me concerning Mr. Williams' work was, that it is just possible that Mr. Williams is mixing too much. In reference to development of peaches I know nothing. You gentlemen who live here can probably see a difference between the climate here and the climate at Charles City, where I live. It is much colder there. But from my own experience in this work I want to advise these young men and old men not to set indiscriminately, but to do just as you would if

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you were endeavoring to improve your stock on your farms—select the very best that you have, and plant in an isolated place—away from other peaches—as far away as you can. Select the hardiest and then the largest, then the trees that have the most resistent foliage throughout all conditions of weather. In a word we need all the perfections brought together that we can get together. By planting seed of the very best, especially in years when they reach their highest perfection, there is no question but you can make a decided advance. In the matter of cross-fertilization, when we have once cross fertilized and know what we have, as for instance in the Greening apple I produced, I didn't produce this artificially, but the tree was set within about two rows of a Rhode Island Greening. There is no question but this variety is a cross between the Duchess of Oldenburg and Rhode Island Greening. Knowing what you know in a cross of that kind our purpose should be not to mingle a great many, but to isolate. I believe we can get remarkable results from simply covering the bloom of every tree like that and not have them contaminated with anything else. In that way we have the hardiness of the Duchess of Oldenburg, and we have one of the most desirable apples in this whole country, the Rhode Island Greening. I would not cross-fertilize, I would simply plant, and preferable from the original tree that has shown such development. We know that the old red crab was crossed with the Bailey sweet apple and produced the Brier's Sweet Crab. When we know a thing of that kind, it is worth a great deal as a stepping stone to further progress. I would be very careful about bringing together many varieties from the north and extreme south to the central.

H. H. MICHENER: Can anyone tell me the exact difference between what is known as the Bailey, or Friday peach and this Lone Tree peach, and what is known as the Blue Grass peach?

GEO. W. EDEN: The Lone Tree peach is yellow; the Bailey peach is a light blush.

FERTILIZATION OF FRUIT.

BY W. A. DUCKWORTH, KEOSAUQUA.

Mr. President, Ladies and Gentlemen:—My paper is entitled The Fertilization of Fruit. I prefer the word fertilization to pollination as I think in the sense in which it is used here, it is more definite.

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In the presentation of this paper I do not expect to tell you gentlemen of the society anything new, my object is to reach the public through the published reports of this meeting.

In the cultivation of fruit, we are often sadly disappointed in the bearing qualities of our trees. The condition of the trees will be good, the season favorable, and the trees will be full of bloom, the fruit may even set on the trees, but the crop may be as is too often the case a complete failure.

Our first business should be to find the cause of the failure, and the best method of preventing it. Now there are several reasons for those failures: a too rapid growth of the tree; winter and spring frosts; heavy rains at the critical period of blooming, or a sudden change of temperature or high drying winds. And fertilization may be ruined by fungi, which is often caused by the use of fresh manure. But the principal cause of the failure of the fruit crop in all kinds of fruit is sterility.

Now as to the remedy; the too rapid growth of a tree can only be remedied by letting the tree alone; quit cultivating; wind, rains, etc., we cannot contend against, except that wind-breaks might be made beneficial as against both wind and frosts.

As for fungi, use only well rotted manure, not that manure is the only cause of fungi, for it is not, but the other causes are hard to contend against, but with warm wet weather and, an orchard manured with fresh manure, the conditions are much harder to deal with.

So the principal cause of the non-fertilization of fruit that we may successfully combat is sterility.

Some fruits are self fertilizing, while others are not, so in planting an orchard, we should avoid planting blocks of one variety, and as the question of fertilization is not fully settled, we should continue our experiments, and find out what kinds of trees to plant contiguous to each other, and we should not be disappointed if we find different results from what we expected, for the conditions are so variable, and the operation of the impregnation of the the bloom from tree to tree and from bloom to bloom is so delicate that the slightest cause will, many times, cause disappointment. We often see Keiffer pear trees bearing full each year which are entirely isolated, and while others planted in large blocks, and sometimes even with Bartletts intermixed, are almost barren. We often see fruit of the same kind which is grown in different localities that are nearly as different as two varieties. It may be that the pollination of the fruit from one particular kind of tree to another will produce a better quality of fruit, and if the theory of Telegony is true, the first fertilization of fruit from a particular tree will affect the fruit for several years after. Now in regard to this theory of Telegony: In Professor Ewarts Penycuik experiments in England, they bred a full blooded Arabian mare the first time to a Zebra, the foal was a hybrid of course strongly marked as a Zebra. The next season the mare was bred to a full blooded Arabian horse, the foal was not only marked as a Zebra with the stripes but had an upright mane with the zebra features about the head; and in another experiment at the same place the results were similar, though not quite so marked. Now if the theory is true in the animal kingdom, why not in the vegetable? And in connection with this subject I will state that the Royal Horticulture Society of London, in their experiments in the hybridization of fruits are investigating this subject of heredity. And it is pretty certain that in the

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hybridization, fertilization or pollination, and the propagation of fruit and flowers, we have much to learn. The Japanese are far ahead of us in the propagation of both fruit and flowers. We may be able to teach them religion and political economy, but when it comes to the cultivation of fruit and flowers we are but infants.

In the planting of trees for proper fertilization the Cornell experiment station makes some recommendations that might be made useful in Iowa. We should of course select varieties that thrive well and that bloom at about the same time.

The best we can do is to mix our trees as much as possible, except the varieties that are known to be self-fertilizing, cultivate to the best advantage, spray in the proper season and trust to Providence for the result.

The larger the orchard the more fruit in proportion, the reason for which is better fertilization, and the larger the orchard the fewer insect pests.

In the cultivation of fruit in Iowa we have as many natural advantages as any other state. The two great drawbacks are non-fertilization and insect pests. And I would recommend that there be adopted a systematic method by this society of a thorough investigation of this subject of fertilization; for in my judgment fertilization of our orchards is the paramount issue.

C. G. BLODGETT: He spoke of heavy rains as being one cause of the lack of fertilization, and also mentioned high, dry winds. I have noticed both and especially dry winds. This last has been worse with me with my strawberries than cold rains. Some of my best plots of strawberries have done well even when we had several days of damp, cold weather. One of my worst crops of strawberries was when we had no rain and no dew while they were blooming, some five or six years ago.

W. GREENE: I asked some questions last season as to the time when cherries ripened, and also as to the time of blooming of other fruits. On investigating further I found that the Early Richmonds were reported as forty-two days between the time of blooming and ripening of fruit. In another series forty-six days were reported. It occured to me that people are cultivating two varieties under the same name, or the same variety on different stocks.

WM. LANGHAM: I have some Early Richmond cherries on sour Morello roots which ripen six days earlier than those on Mahaleb, right along side of them.

H. W. LATHROP: Several years ago I raised Early Richmond cherries on wild plum. Those on the wild plum ripened from three to eight days earlier than the trees from which I cut scions.

W. S. FULTZ: I have got something at my place more singular than that. I took a notion to raise a few Iowa Blush apple trees

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some fourteen years ago. I raised my own trees by root grafting —got thirty scions off the same tree. I planted ten in a group right together. They vary in size at the present time from two inches through and eight or nine feet high to six inches through and from twenty-five to thirty feet high. I cannot account for it only by bud variation. They were planted in the same kind of ground, and grafted on seedling roots at the same time and set in the nursery at the same time. But no two trees have apples alike. One has apples no larger than the Transcendent crab.

C. G. PATTEN: One scientific statement brought out in the gentleman's paper that has some bearing on the experiment with the apple, there was a strong tendency in one of those seedlings which might have been better adapted to the development of the Iowa Blush, and that would be a most excellent tree to select scions from for other work.

F. RICHMAN: I am a little better acquainted with horse culture than with horticulture. The matter mentioned in the paper is not accepted now among horse growers and I think not generally among stock growers, that the first impregnation governs future impregnations. It is well settled among horse growers that it is a fancy.

SEEDLINGS FOR NURSERY WORK.

BY ROLAND SHERBURNE, LONE TREE.

By way of introduction I will say that I am not a commercial nurseryman, but raise my own trees, and have grown a limited number of apple, plum and peach trees for several years. When our Secretary asked me to prepare a paper on some subject for our meeting, I wanted to find a reasonable excuse for not doing so, but could not; yet it is with hesitancy that I choose this subject.

In my remarks, I have reference, chiefly to our own locality, and this prairie region, where we have what we call our test winters. In the Lake region, to the east of us, and in other localities where deep snows fall every winter, or farther south, hardy roots are not of so much importance, but those of us who have had the experience of '98 and '99, know, to our sorrow, the need of better roots for our fruit trees. We have spared no pains to find hardy trees, but how about the roots? O, anything would do. Peach, apricot, Marianna, Myrobolan for the plum, French seedlings for the apple and pear, Mahaleb for the cherry—anything that would grow a tree. We have the result, and is it not high time we should pay strict attention to the roots we use?

We boast of our great country and believe we have the best of everything. We raise the most, the finest, and the greatest variety of fruit of any country

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in the world. It is unpatriotic to send abroad when we have better at home, and it seems to me the sooner we stop sending to Europe for stock the better. We have no more right to send there for seeds and roots to use in our nursery work than we have to send for trees themselves, and that would be preposterous; the question of cheapness, or of their being easily obtained, should not be considered because we want and must have the best irrespective of cost. We are agreed that we should patronize our home nurserymen and plant home grown trees. As a rule we should not plant trees grown south of us, or those grown in other localities under different climatic conditions. I would add that we want our trees on home-grown roots, grown from our best and hardiest seeds and pits. And with the apple or peach, the farther north of us, those seeds are procured the better.

This year, by way of an experiment, I raised about 1,500 seedling apple trees from seed of Duchess, Wealthy, etc., I stratified the seed last fall, planted early and hoed them a few times. They grew large and fine. They are very easily raised, and I would suggest that whoever raises apple trees should see to it that he raises the whole tree, root and top, and spares no pains to get the best and hardiest seed, instead of sending off for his grafts or seedlings from some where else maybe. This fact would be a good advertisement for him. The purchaser demands the best tree, and will cheerfully pay any added cost of the same if he only gets what he pays for. We hear a great deal about long cion on short piece-roots, thus having a tree nearly on its own roots, etc. We cannot depend on that entirely for the root system. Everybody will not plant their trees deep, many will plant them shallow, and unless it is cut off entirely the seedling root will be an integral or greater part of such trees root system, hence the necessity of a hardy root. We cannot excuse ourselves by saying good seed is hard to procure, for if we will but put forth the same effort that the fruit tree agent does when he plays his victims, we will not lack for what we may need.

For plum stock, I use thrifty native seedlings for grafting or budding all kinds. The *Domestica* grafted upon a two year old native whole root close to the collar makes a fine tree and when set out in the orchard by setting the graft deep, say one foot below the surface, you will have a tree that will bear fruit younger than if on its own roots, and it will eventually root from the cion. For my use I would not plant a plum tree grafted on any other stock. I want either native, or a tree on its own roots.

As I am much interested in peaches I wish to make a few observations on that fruit. Sending down into Missouri or Tennessee for peach pits from which to grow our seedlings for budding seems to me very reprehensible. And as long as we do this and grow the varieties in general cultivation, we will make no improvement, and will never make the raising of peaches a success this far north. Of course the nearer we approach the peach belt, the better our chances. A good many seedling trees survived the "freeze" in Iowa, in this latitude and further north, and fruited this year. We want no better proof of their hardiness. If we are going to bud, these are the pits we should grow our seedlings from. The Bailey is also very hardy, and good for budding stock. On heavy soil the plum stock may be still better. We ought to spare no pains with our peach trees. We may not be able to compete with more favored localities, but I believe the time is not far distant when we will be able to raise an abundance of this delicious fruit, and save

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us the money which now goes east and south for the same, and it will come by carefully selecting our choicest seedlings. It is not enough that someone has raised a fine peach from the seed. This same tree may die the first cold winter. Time only will prove its hardiness and when such is found no pains should be spared to still improve it. I state it as an absolute fact, that the Lone Tree peach reproduces itself in fruit perfectly from the pit, when the trees are isolated from any other variety, and I see no reason why some of our other choice seedlings will not do the same thing under like conditions.

Mr. Frank O. Harrington has written me that he will plant by themselves next year, a lot of the Lone Tree peach trees or pits, in order to raise pure pits. Such practical work as this deserves our highest praise. The importance of such work cannot be over estimated. We have trial stations in Iowa for testing and improving our fruits, partly paid for by the state, yet there is a chance to do good individual work ourselves. We know that trees and fruits adjust themselves as near as may be to the locality in which they are grown; therefore, it follows that each generation of pits will be more hardy and suitable for our planting. If we, who are interested in this line of work, will put forth our best efforts, isolate a few trees of some choice variety ourselves, if possible, or by furnishing some of our neighbors pure pits so that they may raise a few isolated trees, we will soon have a plentiful supply of choice pits from which to grow our future trees. And may be we will have solved the problem of profitable peach growing in Southeastern Iowa.

W. H. GUILFORD: I appreciate the suggestion in Mr. Sherburne's paper, but it would be hardly orthodox to say so in a horticultural meeting, that we should establish a farmer's nursery—plant a few peach trees, a few apple trees, start a kindergarten nursery and teach the little boys and girls to graft and bud and care for trees.

R. SHERBURNE: The Lone Tree peach is a true seedling. All the fruit is just alike, a medium sized yellow peach, and of the very highest quality. The trees were so loaded that they broke down this year.

W. S. FULTZ: I might say a word in regard to the so-called Bailey peach. We always claim that this peach reproduces itself from the seed. Evidently it doesn't, because some are hardier than others. They do vary. I find also, that they vary in size. I have seen some quite nice, large peaches, two inches in diameter. Two years ago I had peaches from the middle of July until the frost came. I took some in a little green for fear of frost. This year my peaches ripened from the first of August to the middle of October. You must not plant Bailey pits expecting they will come true to name.

A MEMBER: Has any one present a peach known as a winter peach? On my father's farm forty years ago we had a peach which for years we considered useless. Finally, one year we

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gathered it and put it in the cellar the same as we did the winter apples. Along about Christmas it turned a beautiful yellow. It was a good, large sized freestone, and of as nice a flavor as any peach I ever ate.

C. G. PATTEN: I don't wish to disparage the Bailey peach, but I would say that if it didn't vary in its seedlings it would not be of very great value to horticulturists, because we want something better than that. The fact that some of those trees survived while others were killed proves that there is a variation, though not great. As I remarked, any tree that was hardy that you wish to improve upon, if it didn't have that quality of variation would be of very little value.

C. L. WATROUS: I think it is our good fortune that the law of nature that provides for variation is without exceptions. Whenever you plant seeds and get another seedling you get variations. There is absolutely nothing that does not vary.

H. H. MICHENER: I have a peach tree that came from Muscatine. We planted it in rows by themselves. One went through with very little injury two years ago, only killed back fifteen or eighteen inches. It bloomed in summer and set two or three peaches. This year it made fair growth and had about twenty specimens. It will average two and one-half inches in diameter, a perfect freestone and pit larger than the Bailey. It does not blush up quite as much as the Bailey and the skin is more fuzzy When it gets ripe it is not like Bailey; it gets juicy instead of mealy, and is of better quality and flavor. It is pink and doesn't turn as dark as the Bailey does.

LESSON—PLUMS, PEACHES AND CHERRIES.

CONDUCTED BY ROLAND SHERBURNE, LONE TREE.

R. SHERBURNE: It seems to me that we should make two distinctions, one a family orchard, the other for commercial purposes. To begin with, for a commercial orchard, say of 100 trees, Mr. Harrington, how many varieties would you plant?

F. O. HARRINGTON: We have many trees that are good, the Hawkeye, Stoddard, Wyant. I think I would plant at least sixty per cent. of those three and then a few other varieties.

R. SHERBURNE: Would you add anything to that, Mr. Branson?

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A. BRANSON: I think those three are about the best.

C. G. BLODGETT: I am not a plum man. If I were going to add anything it would be to pass the plum and plant peaches.

C. L. WATROUS: I suppose each man is going to plant for his own locality, and I never would have a market plum orchard unless I had a good many trees of Miner and Wild Goose. I would add Pottawattamie at Des Moines. I used to think I would not have those, but later experience has convinced me that I want some mixture between Americana and Narrow Leaf; that would be Miner and Champion, a narrow leafed plum like Wild Goose and Pottawattamie.

R. SHERBURNE: You remember Dr. Dennis recommended very highly the Whitaker plum.

C. L. WATROUS: It is substantially the Wild Goose.

R. E HINDS: In connection with this the Cornell University experiment station through five years' experimenting, have demonstrated that when you set Wild Goose in blocks you will be troubled with sterility, but by planting Miner near them both bear. They do better together.

R. SHERBURNE: I think it goes without saying, it will not do to plant plums in blocks. You must inter-plant all through. I never fail of a crop. I attribute it partly to my apiary and also to inter-planting. What early plum would you plant?

C. L. WATROUS: Forest Garden for *Americana* is the earliest, and is a very good plum.

R. SHERBURNE: Of good quality and a good looking plum.

C. L. WATROUS: I say of the *Americana* type in places north of where Wild Goose cannot be had for early.

R. SHERBURNE: I think there was an error in our last report that Wyant was an early plum. It is not as early as Forest Garden, and ripens the last of August.

W. GREENE: How does the Milton do, generally? It ripens very early and I think it might answer in this district.

R. SHERBURNE: My opinion is that it is inferior in every respect to the Wild Goose.

C. L. WATROUS: It is a hardier tree, ripens earlier, and if you plant it with Hammer you can get lots of fruit, and sell it.

R. SHERBURNE: In our locality the Wild Goose proves hardy even on its own roots. For private use shall we add any other variety to the list?

W. GREENE; I would add the Burbank.

C. W. BURTON: The De Soto.

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R. SHERBURNE: My opinion is if the De Soto is neglected it amounts to but little, but if given good cultivation it is a fine plum.

W. S. FULTZ: I have been experimenting with the De Soto for several years. I have tried trimming, but I never made a success until last winter. Then I trimmed more than three-fourths of the top away. I prefer that to any other way. If a new sprout comes out take the old trees away just as soon as the young sprout is in bearing. You can always renew from the sprouts.

E. TATUM: I would like to have a word on the De Soto. It needs to be on its own root and needs to be in a rather moist place. It needs more moisture than a good many others. If we thin it, it is a grand plum. I prefer it to Forest Garden. It is not nearly so liable to brown rot, which often takes the Forest Garden.

W. H. GUILFORD: The longer we talk on these subjects the more important it is that we talk on lines that will be most beneficial. Here in the southern part of the state I don't know but what you can do very well with Forest Garden. I fruited it about twenty years and I have never seen any rotten plums in Forest Garden until this year. I don't mix things up. I have no trouble with fertilization at all. I never here about that except in horticultural societies. The Forest Garden is an excellent fruiting plum. Before this year I never saw it rot. The trouble is about every second or third year they are so small that they are entirely worthless. It is the best early plum. I raised ten bushels of Wild Goose this year, but I could not sell them in Dubuque at any price. The market had been glutted with Japan plums and with Michigan plums until the people were nauseated with them and concluded all plums were bad, and it was not until the crop of Forest Garden was half gone before I could get any sale for them. It is impossible to sell early plums in competition with Japan plums. Milton is not of very high quality up with us. It is a little tender and froze down two or three winters. It ripens its fruit for three or four weeks. I have been selling plums from the 25th of July until the first of October and I would not think in a hundred trees of putting in less than ten varieties. Forest Garden has one excellence that I never heard mentioned in horticultural societies. It ripens slowly and a few at a time, while the De Soto ripens all at once. The longer the Forest Garden hangs on the better they are. They are not as large as full grown De Soto. I would give $200 if my whole orchard was on Marianna. I would

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never plant another plum on its own roots. It may be all right for awhile, but it will cost you every dollar of profit to cut out the sprouts. I have had trees on Marianna for the last ten or twelve years and have seen no suckers start. I mulch. I don't cultivate.

MR. DUCKWORTH: The great crop in southern Van Buren county was two varieties of Damson, two varieties of Wild Goose and another plum that looks like it but ripens later, called the Late Wild Goose, and the Green Gage. There is another plum which is very successful there which the people call the German Prune.

C. L. WATROUS: That is a well known variety of the Domestica.

C. G. BLODGETT: I was going to keep still because I know that most of our members must use the natives, north of this latitude anyway. In the southeastern counties of Iowa these European plums and some of the Japans are the plums. We can do something with them.

R. SHERBURNE: In my opinion it appears to be a mistake not to plant some Domesticas.

GEO. W. EDEN: The Domesticas in our part of the country seem to do better than the natives as a whole. We have several kinds of these Domesticas and we get a crop just about as often, or more often, than we do of the natives, and we can do something with them when we get a crop.

R. SHERBURNE: I have a seedling of the Lombard that I believe had more plums than leaves. Those on native roots I noticed did'nt ripen a plum, while those on their own roots had a few plums that rotted. It has been my experience that plums are better picked early. I would pick the De Soto before it turns. Those that have fully ripened are bitter, while if picked before fully ripe they are all right. The plum in my opinion requires different treatment from other fruit. As the skin matures the flavor is different. You would not recognize the same fruit in ten days' difference of picking.

C. G. PATTEN: About cherries—the Montmorency. There is considerable contention in reference to it. Which is the best Montmorency?

C. L. WATROUS: It is a small, round tree with short, stubby branches—low down. The Montmorency ordinary grows very much larger, while the Early and Late Richmond grow scraggly. The Montmorency grows fewer branches and larger and more upright. It can be told at sight just because of its round top,

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MONTMORENCY ORDINAIRE.

LARGE MONTMORENCY.

Trees planted by Mr. Fultz in spring of 1885, at one year old. Photographs taken December, 1900, to show habit of these two sorts.

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which looks upward while Richmond looks downward. The cherry is red, and very much like Early Richmond, but it begins to bc red only when the Richmonds are gone.

WM. LANGHAM: What is the difference between the two kinds?

C. L. WATROUS: I could not state in words what the difference is, but if you get Montmorency Ordinary you don't need to know anything about the other.

E. TATUM: This same subject was argued at Chicago at a nurseryman's convention. There seemed to be about four dozen classes of Montmorencies, large and ordinary. The one Captain Watrous described was generally considered to be Large Montmorency there.

R. SHERBURNE: Be good to your young seedlings, mulch carefully and set deep when you transplant. Be careful of the root system until they get down and become well established.

A MEMBER: What time should seeds be planted to get the best results?

R. SHERBURNE: As soon as the fruit is used. Plant in wet sand. If season requires mulch, and transplant in the spring. How far apart would you plant plums?

F. O. HARRINGTON: Ten by twenty feet.

GEO. W. EDEN: Ten by sixteen feet.

C. L. WATROUS: Fourteen by twenty feet, and put small fruits between.

R. SHERBURNE: The distance apart depends upon the kinds, whether fast or slow growing. Peaches, distance apart?

W. A. DUCKWORTH: Eight by twenty feet.

H. H. MICHENER: It depends upon the location. Some advocate a theory of about eight by ten feet apart in the row and give rows plenty of air drainage between.

R. SHERBURNE: Peaches are more susceptible to sunshine than any other fruit. Not less than ten by sixteen feet; ten by twenty is better. Rows running north and south. Cherries, best varieties?

H. HARRINGTON: Late Montmorency is my first choice. Four-fifths of the nurserymen in Chicago said Late Montmorency was the one to plant.

A MEMBER: What about the Silver Thorne cherry?

W. S. FULTZ: It stands in about the same grade as the Late Richmond. About every third or fourth year you get a good crop; then you don't get anything for three or four years. Quality about as good as Late Richmond.

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CHAS. E. DEWEL: I want to tell you about a freak. It came in a lot of English Morillos. It is the color of an English Morillo, but not quite as large. I never noticed any difference at all until it fruited this year. It is very early and was all gone when the Early Richmonds were ripe. There is one peculiarity about the cherries—possibly one-tenth this year were double, and double ones were perfect cherries.

R. SHERBURNE: Distance apart for planting cherries?

A. BRANSON: About twelve feet one way and twenty feet the other.

R. SHERBURNE: Those that I have planted are ten by twenty and ten by sixteen. I can cultivate better if the rows are far apart.

AFTERNOON SESSION—SECOND DAY.

PRESENT AND FUTURE OF HORTICULTURE IN THE UPPER MISSISSIPPI VALLEY.

BY C. G. PATTEN, CHARLES CITY.

Members of the Eastern Horticultural Society, did you ever consider that we are nearly in the center of a territory about seven hundred miles square. in the upper Mississippi Valley, that comprises the richest agricultural area of like extent on the American Continent. An area traversed by two immense rivers, bordering upon great lakes, with a gently undulating surface enriched by vegetable accumulations for ages, before civilized man came upon it, and that that civilization is the highest and best that he has ever beheld. With a climate no where excelled for the uniform production of all the grains and grasses that are essential to the highest agriculture and horticulture, and the highest civilization. A climate that has developed some of the types of native fruits. from the strawberry, dewberry, raspberry, blackberry and cranberry, up to the plum and apple. The last two, the largest in variety, and when size and quality are considered, are, I believe, equal to if not superior to any native fruits that have ever been discovered.

Within and just outside of the borders of Iowa more native plums of excellence have been discovered than in all the United States besides, and now that we have began to look for them we discover that the native wild apple has, in some cases, reached almost the size of our smaller cultivated sorts. With such beginnings, and such environing climatic conditions, who shall predict that out of these two species of fruits there shall not come some of the most valuable contributions to our future pomology. With our plums we have already made such progress that it is not difficult to forsee that in the short space of twenty-five years they will vie in quality and in almost every other desired characteristic with the most favored varieties of other species. And I believe that a combination of the American type combined

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with the Chickasan or miner type will ultimately produce varieties that, in their sprightly, peach-like flavor, will surpass any other plums, and also in their easily digestable qualities. If this climate has produced such mutual products what may we not reasonably expect under conditions of highest development and culture.

The whole country, from twenty-five to forty miles on either side of the Mississippi is especially adapted to the culture of both the small and the large fruits, and if the people who engage in fruit growing would study the climate and soil conditions, and the adaptation of the different varieties and kinds to special soils, slopes and elevations, in fact everything that would tend to large success, to that degree that the fruit growers do in California and other portions of the western coast and the mountain districts in the interior, I am sure that the returns on the whole would be far more profitable in this valley than in the other regions referred to. Almost everywhere in this great Mississippi valley the land is good, while everywhere in the mountains and coast regions mentioned good lands are the exception, and very often upon a half dozen acres there are almost as many different soils and combinations which render it very difficult to plant orchards with any surity of final success; here general uniformity is the rule, there general ununiformity.

This great valley is really great in almost every particular. Great is its almost uniform fertility, great in its climatic conditions, that make bounteous harvests almost a surity. While in countries of much less rainfall, with warmer skies and less destructive storms, the tillers of the soil are worried and fretted for the want of rains, and finally, after arduous labor, crops fail to meet the expenses incurred in their production. Here, as I have said, there is greatness and abundance everywhere in fruit culture as well, if we will but have it so. The natural fertility of this valley, coupled with its well defined seasons and reasonably abundant moisture, will continue for ages to make it great. Great in its gardens, great in its orchards, great in its farms, great in its rural villages and cities, and great in its inhabitants, and especially great in its manhood and womanhood, when the hour shall come wherein its citizens shall declare that the terribly pernicious and desolating liquor traffic shall dominate no longer, neither in home or nation.

It is quite common in cold climates to hear people sighing for a home in a warmer latitude. Indeed I used to think that a climate where autumn faded gently into winter, and a winter where the cold would be scarcely greater than our April and May, would be an ideal climate, but I have greatly changed my thought on this subject, so much so that I now believe that a fairly rigorous winter is, on the whole, a great blessing to mankind. In semi-tropical climates, for the tillers of the soil there is scarcely any cessation of labor. If there is any season of relaxation it comes in the heat of the summer, when the whole system is relaxed, and when mental labor is irksome. In cold climates people are compelled by the very nature of their conditions to be thoughtful and provident for the future, and when winter has come markedly changed conditions have taken place, and change is rest, both for mind and body. The changing seasons gives man zest, bring men impulses, give men pleasure and quickens all our activities. Such a climate produces the highest type of men, it is the nearest to an ideal climate for the human race, and such is the climate of the Upper Mississippi Valley.

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Surely, then, the future of horticulture in this valley must be of very great importance. We have only to forecast a little to see that in twenty-five years there will be eleven or twelve million souls living in this area. Great markets will have sprung up in the increasing centers of trade, and there can be little doubt that home production will largely supply them. The fact is already proven that from the point already attained in the adaptation of fruits to this region, we can see that progress is much more rapid and certain than was believed possible but a few years since. From our best raspberries, grapes and cherries and apples, and all kinds of our fruits there will spring up still bet-better varieties. The work of the experiment station is already so supplemented with individual effort that there can be no doubt of rapid progress being made. The successes of one energetic man with pears, Mr. A. B. Mathews, of Knoxville, is but the prophesy of what twenty-five years will develop in this fruit. In every enterprise that is really worthy of our effort, faith, hope and labor are the trinity that unlocks the door to success. We cannot be mere copyists, we must be originators.

W. H. GUILFORD: The probability is that the development of a very high quality of plum will be brought about by a combination of Chickasaw and another variety. Some fifteen years ago a neighbor of mine bought a few bushels of plums shipped from the South into Dubuque and gave me half. From them I got a cross between the Chickasaw and Americana. I have sent some around to different parties and it will soon be reported on. It has the reputation of being the finest dessert plum there is. It is not such a hard matter to fruit seedlings as some people think. I will tell you how I intend to fruit them. I shall put out this spring about an acre and a half of blackberries, the rows eight feet apart. I will go along about every ten feet and stick in one of those little seedlings. The same cultivation will bring up both. The shade of the plum won't hurt the blackberry and the blackberry won't hurt the plum.

W. T. RICHEY: I believe all of us ought to do a little more experimental work. I have been experimenting in seedling plums myself. By and by I think we will get something that will prove valuable. It doesn't take long to fruit these seedlings.

C. L. WATROUS: I have more than one sort of plum growing on the same tree. I am going to follow grafting some of the narrow leaved sorts, some of the Southern type, into trees of the Norhern sort. This year nearly all that I have of the Americana type didn't seem to be feeling just right, the fruit largely rotted, but that of the Miner and the narrow leaved type rotted very little. This Mr. Williams, of whom I spoke this forenoon, says that in his work he finds that if he gets seedlings of the Americana, the strictly Northern type in this region, that the leaves become

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soft and they take on an approach to the Southern type of leaf. On the other hand, if he grows seedlings of the strictly Southern type, the narrow leaf, the leaves tend to become broader, which shows that our success will be with that sort of leaf which this climate produces. Each climate tends to produce the sort that is best adapted to it. Nature grows things all together and the crosses are multitudinous. We are often discouraged because we do not get something right at first.

W. H. GUILFORD: What do you think of the advisability of planting the second generation from the same cross?

C. L. WATROUS: That is all right. After you have a fixed type carry that on.

A. BRANSON: The Texas trees come out reasonably early and the leaves are all on now. But with the Klondyke plum the leaves were off long ago. I think it has been said, in regard to the second generation, that it is better to have a few out of a certain family than to have those extreme crosses.

INSTRUCTIONS IN TREE PLANTING.

BY F. O. HARRINGTON, YORK CENTER.

This paper is not written for the benefit of the expert tree planter, or orchardist, he does not need it, his own studies and experiences should be sufficient guide to intelligent planting, but the inexperienced planters, the busy work day people with their multifarious cares, with little study on the subject, and perhaps less inclination, who yet should plant an orchard, even though it be but a half a dozen trees on a village lot, or a few more on the farm homestead, he, or she, is the one I would like to reach with this instruction, because they have need of it. I divide my subject into sub-heads consecutively as follows: Location, autumn preparation, buying trees, spring preparation, planting, pruning, cultivation.

Location of orchard: My ideal for location of an apple, or plum orchard, is a north-east, north or eastern exposure, or slope, on high land, but not broken, or so steep that it could not be given good cultivation. I would want good soil with clay, but not gravel beneath. A soil that would furnish a reasonable amount of moisture, is needed for the trees that are in the process of "manufacturing" five, ten, or twenty bushels of apples in the hot sun and drouth conditions of August and early September. Nearly level lands if high and dry and with good air drainage, I believe to be all right, and may and probably will prove the more lasting for profitable fruiting. A southwestern exposure, particularly if somewhat steep inclines, is least desirable of all. In such a slope the trees are more exposed to alternate freezing and thawing, causing injury to cell structure, during mild weather in winter, and thus much more liable to sun scald and premature decay. I do not wish to be

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understood as laying too much stress upon location, for while having a decided preference, I would still insist that every tiller of the soil have an orchard, unless it be very low, wet soil, that might be called marsh lands. He in my opinion is the only tiller of the soils of our fair Iowa, who would better buy his fruit than grow it.

Air drainage and circulation: As I but a moment ago referred to air drainage, it might be well to state that this is a subject that is possibly little known, or at the least understood, by a large portion of our people. As applied to orchard sites or locations, it is to be understood as meaning a selection of land that from its conformation will permit of the flow of cold night air, and fogs to lower adjacent levels. This drainage of cold air is important in promoting exemption from late spring frosts or those in early autumn, and is important also in some other respects, which I will not now stop to explain. We might illustrate the process of air drainage, by comparing cold air with water, and is like water because of its greater weight and freedom from cohesion, it constantly seeks the lower levels. Thus you may readily see that a tract of land of limited area, and surrounded by lower levels, having hollows or ravines upon all sides, leading down to these lower levels, would readily and quickly be drained of surplus surface water, and as well, but not as rapidly as of cold air. Again suppose that not far from the tract of land I have referred to we might find another tract, exactly of the same elevation, level over all its surface, of we will say six miles square, thus affording slight air drainage over nearly all of that surface, what think you would be the difference in temperature upon those two tracts of land, when a cool night occurs in last of April or late in September, I cannot state exactly in degrees, but consider that there would frequently be the difference between destruction and safety to blossoms or fruit. So then in planting the orchard the points most perfectly above frost and fog line, should be used and this thought be kept clearly before the mind that while tree wind-breaks are something to be greatly desired to shelter the home and the feed lots, that the orchard needs all the air movement from the west and north that is to be had, excepting only severe storms. From home orchards many will not be able to select such locations, but do not therefore refuse to plant at all. For commercial orchards we ought to select the higher bluff lands along our streams, or the prairie divides between, and wholly unsheltered, for perfect air circulation and drainage. I will refer to preparation of soil later on and pass now to the

Purchasing of Trees: Make arrangements for the trees you wish two or three months before they are to be planted. You might do this later, but you are more liable to fail in getting just the particular varieties you wish, while if your order is in early the varieties you order are reserved for you regardless of later demands, provided your orders are placed with responsible nurserymen, as they should be, even though they be made through the medium of a local agent. My advice to every man living within a reasonable distance of a good nursery is to go to that nursery for the trees he wishes to plant. He will get trees very much cheaper and in better condition and both are items worth looking after carefully. Never purchase from anyone before you have learned just what they are and how they are doing business, and very likely you will do well to take some other mans word for that too. The two most serious objections to your patronizing the itinerant peddler of

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trees are first the large price paid, second the very general substitution of trees other than the kinds ordered. When you ordinarily pay more than 12½ cents per tree for apple, and other trees proportionately you are so far as you are personally concerned throwing away the money you pay in excess of that amount, because I freely admit that the "other fellow" who perhaps sold you trees at $1.00 each does not consider the money thrown away. A very large proportion of trees sold by such men are not the varieties that they are labeled to be. Within a year we have had a case up before our district court in my home county of Iowa, in which a tree peddler had sold trees purporting to be certain varieties of budded trees, and coming from a certain nursery firm in Ohio. The trees did not come from Ohio, were not budded trees, (that is the apple) and were perhaps half of them true to name as shown by the labels. I know this because I was called upon to make examination, as an expert, of these trees. This bill in suit was $100.00 about, and all that stock in kind and quality could have been bought right at our home nursery at Williamsburg that spring for about $13.00 at the regular retail price, as I testified before the grand jury and later in court. This was just one bill sold by this man, out of a large number in our county that year, and every year too. Why don't you people use the good common sense you show about some other matters in your purchase of trees, etc. Really less of that very necessary article is shown in this respect than is shown by some small boys who are still tied to their mothers apron strings. My friend I want to say to you very earnestly that you cannot afford to patronize an irresponsible tree peddler. Life is too short; and time is too valuable to devote several years work and waiting on a young orchard to find at last that it is worthless by reason of trees being of too tender varieties, or of worthless seedlings (though they might be Russian at $1.00 each) or even because they are all crab apples, as in more than one case that has come under my own observation. Don't be humbugged by specious claims about budded apple trees, at least ninety per cent. of seedling apple trees are too tender to go uninjured through many of our Iowa winters. The state, and our other Iowa horticultural societies, have repeatedly passed resolutions condemning the commercial use of budded apple trees in Iowa. Professor Hansen of the experiment station at Brookings, South Dakota, states that in that section the one year root graft apple trees will usually kill unless extra protection is given, and entirely through the killing of the roots of the tender American apple seedling under them while at the same time an examination shows that down to the junction with the seedling root the cion is bright and green, of the hardy varieties that are usually grown there, and would continue to grow in the spring if there were live roots left to furnish the wherewith-all for such growth. And yet when seedling roots of the old Yellow Siberian crab were used there was no root killing at all, nor would there be even though these Siberian stocks were budded above the ground line. So you may clearly see that the objection to budded apple trees lies in the tenderness of the seedlings which are mainly grown from eastern seed, almost universally used because we have little else to use if we except French crab stock, which is even more tender. So that while the stocks used are much too tender for western conditions, it cannot be immediately dispensed with and a hardy one like the Virginia crab substituted. Do not misunderstand me and think I class all men who are selling trees, as

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humbugs, it is not my intention to do this, for I do not believe it to be true, but there are too many of whom it is true. From my earliest remembrance there has been a strong tendency with me to accept every man as an honest man, until he proved himself to be otherwise. Yet, nevertheless, I would earnestly advise that every traveling tree peddler be looked upon with suspicion until he has proved himself to be honest, and then he need never go outside of his friends and acquaintances, or at least those who know of him through local reputation, and now while I have given you some earnest and truthful words of warning, I realize that my influence is small and not far-reaching. So I expect some of you will still bite at the alluring bait so deftly and attractingly held before you by some oily-tongued "gentleman of the road." Now if you are becoming tired of the tree agent and his peculiar methods (as indeed, you ought to be) we will look for a brief space on the subject of preparation of soil. Thorough preparation of the soil before planting the orchard, is, to say the least, very desirable. The more thorough and deeper the preparation, the better will it hold the moisture. Fall plowing is preferable when it can be done, and then as with the potato patch, if again plowed in spring, it would be in pretty good condition, after thorough harrowing, to plant upon. But one other thing you would find of great advantage and especially on heavy clays, or hard-pan soil, would be to run a subsoil plow in the furrow after the other plow and break up the subsoil to the depth of fifteen or sixteen inches. The experiment had been pretty thoroughly tried, where the subsoil was of a hard-pan nature, or stony or hard clay upon which trees grew poorly, to prepare the spot where each tree was to be placed by drilling or boring a large and deep enough hole to put in a half-pound dynamite cartridge four to five feet down, explode it, and then fill up and plant the tree on the spot, and has been followed by remarkable success in growth and productiveness.

Varieties: I cannot, in the scope of a paper of this character, go into details of varieties of the various kinds of fruit, for I would, as some of our Irish friends say, come "fornenst" a huge subject. Neither do I wish to state to what extent I think each one in his character as a fruit grower or gardener, ought to experiment with the new things that are continually and persistently being advertised and set before you by other methods. Each must decide largely for himself to what extent he shall try them. Of course this much is to the credit of "new things," that the stand-bys of to-day were the novelties of, perchance, but a few short years ago, and some of the novelties of to-day will unquestionably become the stand-bys of a few years hence, but do you fully realize through what a process of sifting these have passed or must pass through, until they exemplify Darwin's theory of "the survival of the fittest." But one thing I want to say to you along this line, and state it emphatically, and well for you if you heed the injunction, do not buy of the man who offers monstrosities. Do not look for impossibilities in this direction, they do not exist save in the lurid imaginations of the slick tongued tree man, and the equally unreliable pictures and gross misrepresentations of some (I am glad to say but few) growers or dealers in seeds and nursery stock.

Fall Planting: It is entirely an error to recommend as many do, fall planting in this and more northerly sections of Iowa. Our climate is so dry and cold that it is only an occasional year that it will succeed satisfactorily.

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If the practice of fall planting is adopted it will result only in failure in a large majority of cases. But if you must and will plant in autumn, lean your trees in setting well to the south by southwest. After setting bank up around the tree a wide mound eighteen to twenty inches high, then cover with a heavy coat of stable manure; this prevents freezing until late, and when it does freeze will keep frozen until spring opens, when everything should be removed from around the tree to the former level. Your criticism will be that this means hard labor and plenty of it; granted, but it is preferable to dead trees. My advice is, do not get trees in the fall, but should you do so do not plant them then, but rather dig in a high, dry place, a trench three feet deep and three or four wide, and as long as may be needed, depending upon the number of trees to be buried. One end of the trench to be a slope of about 45°, upon which commence laying your trees with roots down on bottom of trench, and the tops will reach but little above the original level, make the layer thin enough that you may pack plenty of fine earth between the roots. Cover this layer, roots, bodies and tops, taking care that the earth is firmly packed around the roots. Commence with another layer, treating in the same manner until all are in; now mound up the earth over the whole, leaving ditches not too near, around the outside for draining off the surface water; now if you will haul some old strawy manure and cover the mound you may rely on good trees at planting time in spring, except it might be peach trees, upon which unless the soil is dry the buds might be liable to rot.

When to plant: The proper planting season is not to be determined by date, nor yet altogether by season, but more by condition of trees and soil. If the soil is quite dry trees ought to be planted before they are starting to grow. On the other hand if soil is quite moist and weather is damp trees may safely be planted, even if out in full leaf, which I have several times done, but of course do not plant when the soil is too wet. If when a handful is taken up in the hand and squeezed it remains a ball which does not crumble readily, it is too wet to plant in, better be in your beds sleeping than planting trees then. My preference in time to plant all fruit trees is at the time the soil begins to warm up enough to make the conditions favorable for starting growth, but before it has actually commenced. This applies also to all of the deciduous trees, but not to the cone bearing trees, with a few exceptions, the Larches being a notable exception, and require very early planting for perfect success, as they germinate at low temperatures and are impatient of any handling thereafter. All of our common evergreens will grow better, unless in exceptionally hot, dry weather and soil, if not planted until the new growth has burst out the buds for active work. As I shall not again refer to the evergreens I wish to state that the critical point in the handling of the evergreen, is in not allowing the roots to dry even for a few minutes. The sap of the coniferous trees is resinous in its nature, and upon slight exposure to dry air, the evaporation hardens it and thus hermetrically seals up the pores and all the water in christendom cannot again dissolve it. It languishes and dies for want of water though surrounded by it, like a man adrift in mid-ocean.

Care of trees: You are supposed to have received your trees in good condition, so far as you may prevent by good care, do not allow the roots to be exposed to wind or sun. Many fine trees are destroyed after being received

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in good order through lack of proper attention. I have frequently seen trees loaded on a wagon with all the roots fully exposed to hot sun, and strong drying winds of April for hours, without a seeming thought on the new owner's part that this was not the best way. It always gives one the same feeling as seeing some unreasonable and cruel man abusing dumb animals in his power, without just reason. If it is not to be had on the nursery grounds, take from home a plentiful supply of old, damp, or wet, or if that is not at hand, dry straw. In packing trees in wagons leave straw enough beneath and pack among the roots while filling up, with good supply over all the root portion at least. Then wet down the whole thoroughly and you may go over fifty miles without injury unless it be from chafing of tops together and that might be obviated by scattering straw all through the tops while loading, then bind all down tightly. If trees are really dried so as to be shriveled, which may sometimes happen to trees shipped, place them root and tops in water if conveniently at hand, allowing to remain for twelve hours, or more, or if the roots can be placed in water and wet hay be thrown over the tops, and water occasionally thrown over to keep the hay wet. Or dry trench in mellow, moist soil and bury completely allowing to remain three or four days, and you will find your trees fresh and plump and really in fairly good condition to grow, provided always that the trees are entirely dormant. If not ready to plant your trees when received heel them in, in mellow moist soil, and if in the sunlight place tops toward the south, letting tops lean at an angle of 25° to 30° from the horizontal. If to be long there sprinkle a little hay over the tops to shade from the sun. The method I follow for keeping my trees in perfect condition for hours while planting out in the orchard regardless of weather conditions, is to use a wagon with high top box (low wheels best) using gunny sacking all around the top to save bruising the trees by the jolting and rubbing. Old wet straw, a good supply having it well wet. Take out trees from the heeling ground, trimming the roots by cutting away all injured portions, back to sound wood, however short that may be, and cutting off all others at about eight inches from body of tree, packing in wagon in leaning position of perhaps 45°, plenty of straw over bottom and also around and above the roots. When I have as many loaded as I can plant in the half days work I am ready for the orchard, except to drive to the stock tank and pour several pails of water well distributed over them, and every root is wet, and will remain so all day if need be. I drive along beside the row I am planting, and take out each tree as I wish to set it, every fibre of its roots fresh and moist. With an old quiet team the driving is slight trouble. The advantages are, no time is wasted and no roots are drying.

Planting: Unless you have used the subsoil plow and have all the soil in fine condition you will do well to dig large holes, dig as deep as needed then work up the soil in the bottom without removing it to make a mellow bed. Set tree three or four inches deeper than they stood in nursery. In setting straighten out all of the roots in their natural position as nearly as it is convenient to do, filling in a little fine moist earth, then work the tree up and down slightly in the manner of the churn dasher of our boyhood days, to sift and settle this soil among the roots. If necessary to do this perfectly use the fingers but if the soil is fine enough this is not needed. After filling the hole in this manner one-fourth full put in your foot and tread firmly. A little more earth and more firming of the soil untill nearly level full, leav-

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ing the top soil loose and fine. It would be a very rare case when I would advise the use of water at setting.

Pruning: When your trees are set out prune at once. Cut out all broken branches and some other if growing out from the stem too close together and shorten the rest by cutting off at least one-third of the last years growth, always leaving a central main stem as a leader. Do not cut out the centers as is done in the eastern states because our climate requires different treatment with our trees. Always set the heavier and longer branches toward the south and southwest, then in trimming cut out most on the opposite side. Why, because the universal tendency is, for all out fruit trees and many others to grow top-heavy toward the north, lean over and thus leaving the trunks exposed, and sun-scald and damage to the bodies, being the common sequel. The consensus of opinion and experience in all of our western country now favors low heads, say from 20 to 36 inches and the setting out of the young trees at a marked angle, towards the one or two o'clock sun. Then with the heaviest portion of the top in that direction and with subsequent proper pruning, you may be able to keep a properly balanced top and protect the bodies of your trees in so doing.

Cultivation: While first, last and all the time, I would advise thorough cultivation for a newly set tree or plant, if possible, yet conditions may be and are such at times, that this is not practicable. Then the best thing to do, and do it immediately is to mulch thoroughly and heavily to conserve the moisture already in the soil, and to keep the earth beneath in a mechanical condition suitable for the needs of the tree in stimulating it into active growth. Always remove labels from trees when, or soon after setting, because many fine trees are destroyed by leaving them on, as nearly all labels are attached with wire, new growth causes rapid enlargement, soon covering the wire and strangulation and subsequent breaking down of the tree is the final result. Make a diagram or plot of the orchard and make a record on that of the posititon occupied by the different varieties and throw away the labels.

W. H. GUILFORD: A good long article, and well worthy of your consideration. There is more loss in this experimental work, more absolute dollars and years of labor lost from that little careless trick of depending upon a little wooden label than from anything else. When we buy a threashing machine, or other machine, instructions are sent out how to operate it. It seems to me it would be a fine thing if our nurserymen would send out their instructions how to plant, etc. Mr. Harrington spoke of healing in trees. I agree with him, but look out for the mice.

F. O. HARRINGTON: If he will consider my statement he will find that there is not even an inch of the top exposed.

S. C. GARDNER: You said that you leaned your trees with a marked angle toward the 2 o'clock sun. Now why would you do so, when the tendency and trend of all growth is upright?

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F. O. HARRINGTON: It is a fact well known to orchardists that trees planted in a perpendicular position will, in three month, lean decidedly to the north and northeast. It is to counteract that tendency.

R. SHERBURNE: We have a southwest trade-wind during the growing season.

F. O. HARRINGTON: That doesn't explain all. There is more moisture on the north side of the tree.

A. BRANSON: I consider that paper very practical, and those who read our volumes will certainly get information and instruction from it. Regarding the preparation of the soil. In about 1860 I remember my father's first orchard killed out. He went to a nursery eight or ten miles away and left me to dig holes. I dug one row of holes three to three and one-half feet deep and three and one-half feet across. The trees set in those holes lasted longer than any other trees set out that year, and I think they are alive to-day.

C. L. WATROUS: The sub-soil plow is an exceedingly good help in planting trees. I lay off the planting ground with the rows north and south, and always put them nearer together in the row.

MR. CARR: If a man has a sandy hillside sloping to the southwest, and not fit by location and environment for farm crops, is there any tree that will thrive on that location?

W. H. GUILFORD: The cherry.

F. O. HARRINGTON: I do not know of any, unless persimmons might.

MEMBER: Does the peach do well on sandy soil?

R. SHERBURNE: Michigan has nothing but sand, and the poorest sand at that, but the peach does well there.

S. C. GARDNER: And also in New Jersey and Delaware.

C. L. WATROUS: Every year we have trouble in trying to give some instructions that will prevent men from being terribly swindled by the peripatetic tree dealer. In the course of several years experience at Des Moines I have been approached by different men wanting to act as agents to sell trees. I have learned the methods of some of the slickest of these men, who sell trees for the very highest price and make the most money. They make a great deal more money with the same exertion than the nurseryman who does a strictly honest business. They run in crews, and they have to be good talkers, and not too conscientious. In 99 cases out of 100 a tree peddler buys what he thinks will fill his

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orders best, and wherever he can buy cheapest. He buys something that will look like what he has sold, but without the slightest regard to whether it is or not. These men invariably sell for prices two to four times what the legitimate nurseryman asks for his stock, so that if a man comes, and he is exceptionally well dressed and drives a good rig, and offers to sell you new kinds of fruit that you have not heard of, specialties at from three to four times the ordinary price, no matter how plausible his story may be about the nursery he represents, you may set it down, the finer his story, and the finer the fruit he claims to have, and the higher the price, the more it becomes you to watch out, for that man is a tree peddler. He buys his stock where he can and burns over the ground. May be he will come back the next year, but the probability is that he goes to another locality. Those are the characteristics that designate the breed. The average farmer from the country is taken in with this, and parts with his dollars.

W. T. RICHEY: I don't see any remedy for this nuisance but one, that is for our home nurseries to start men out, honorable men, to canvas for their nurseries. Many men never go to a nursery to buy anything.

STRAWBERRY CULTURE.

BY D. B. SPEER, BLUE GRASS.

I have been interested in strawberry culture for a number of years, and my aim has been to do as little work as possible, but do all that is necessary, and taking advantage of the easier methods if they do the work as well. Most of the advice received through agricultural papers is given by men who cultivate blanket sized patches in their gardens, which if seen might be admired for the luxuriant growth of blue grass and white clover. Their advice cannot be applied to field culture. But field culture slightly modified, using a hand cultivator instead of the horse, can be used in the garden to good advantage.

Strawberry culture is the subject assigned me and I will give my method of cultivation as near as I can, seasons permitting. I want ground that has been well cultivated three years at least, to insure against grubs and grass seed; common weeds do not trouble me much, as they are almost entirely destroyed by close cultivation. The prime object of which is to retain moisture and keep plants in a vigorous condition. Plow the ground in the fall; never in the spring, as we want it compact to retain moisture. Commence cultivating about the first of May, if the ground is in condition, with a disc or acme harrow, and stirring the ground about three inches deep, and follow with the harrow and planker or crusher until the surface is smooth and mellow. Then we use a light marker with slats nailed on two feet

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apart, for crossing the field; and for marking lengthwise, or the way the rows are to run, use a common corn planter with blades set three feet eight inches apart, cutting four inches deep, and wheels following blades the same as in planting corn.

We dig plants with a five-prong potato hook, cutting off leaves and runners and cutting roots to four inches in length. Then we dip the roots in water, being careful not to wet the leaves, and pack carefully in common five or ten cent baskets. A boy can drop on the cross marks for two men planting, being careful not to drop faster than needed, as we want the roots moist enough for the dirt to adhere when planted. The corn planter blade makes a nice mark easily opened with the hand to insert the plant, also gives us the proper guage to set the crown level with the surface.

Immediately after planting is done go over the field with a roller, Then we cultivate the rows the way planted, with a two-horse spring tooth corn cultivator with the inside spring tooth on each side of the row removed, substituting a stiff shank with a twelve inch knife attached running close to plants and cutting two inches deep. In about a week we use the cultivator again. Then we cross the beds with a light home made V shaped weeder, with a spread of about five feet. We cultivate after rain as soon as the ground is dry enough to crumble, or in case of dry weather, every seven or eight days, always crossing the field with the weeder after using the cultivator, until runners begin to set. Then use cultivator only, going the same way on the row each time so as to keep the runners straight. We narrow the cultivator gradually until we have a matted row sufficiently thick and one foot wide. If there is danger of too many plants setting, we let the row spread to sixteen inches, the plants will naturally set along the edge of the row. When going through with the cultivator for the last time, which will be about the middle of August, we cut in and leave the row the required width. Then we drill a row of kaffir corn or sugar cane between rows, going through again with the weeder when the plants are coming through the ground. This finishes our season's cultivation for the new bed. For a second crop we have no settled plan, but do the best we can, for the ground may be so dry and hard after berries are picked that we cannot scar it with a stirring plow. I have been successful when the ground could be plowed by running three back furrows between the rows, throwing the last furrow over so as to cover the strip of plants left for next year's bearing. Leave the plants covered until the furrows are dried out, which may be in a week or ten days, then cross harrow with teeth set straight until the ground is smooth. In a few days the plants will show the rows, then cultivation may be continued the same as described for a new bed. This is the outline of cultivation as practiced by us on our black prairie soil and we have been reasonably successful. It may not be so well adapted to other soils or to rough and rolling ground, but constant shallow cultivation where it can be used will retain sufficient moisture, through our dryest seasons, to produce fine plants in abundance.

C. L. WATROUS: I don't fully understand about throwing over heavy furrows to prepare for the second year.

D. B. SPEER: By planting my rows three feet eight inches apart and by breaking up the last row, I can easily cover the row

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on the opposite side with a furrow. It is difficult to keep from it and it is better to have it go on. We have already picked one crop and in this way prepare for the next year's berries. Throw the furrow on it and let it remain for two weeks. Then you cross cultivate and clean up your rows.

W. S. FULTZ: Have you not sometimes made a failure in getting good runners in the fall when it was very dry.

D. B. SPEER: In that case I leave in until spring. I have had no trouble. It seems the moisture will naturally go to the surface when you get that surface pulverized.

C. G. BLODGETT: I have frequently tried that plan and in the last ten years I have had two or three complete failures in getting new runners. A year ago last fall was one of them.

W. T. RICHEY: Do you mulch in the fall?

D. B. SPEER: The Kaffir corn is all the protection you need. It don't form a heavy stalk.

C. L. WATROUS: Just a single row?

D. B. SPEER: Just a single row in the center. Kaffir corn does not form heavy stalks like sugar cane or common field corn.

A. BRANSON: Would not sweet corn answer just as well?

D. B. SPEER: No sir, sweet corn would be more brittle. Kaffir corn is tough and remains there until spring. Plant it about the middle of August.

C. G. BLODGETT: I never tried planting anything, but I saw it tried at Burlington about 1876 by an eastern man, who had a fine plat of two or three acres, and along in August he sowed oats, cultivating a strip between the rows. The fall proved to be similar to our past fall, very warm and late, and when winter set in the oats were almost ready to head up. That winter was hard and dry and the oats killed and fell down, and the next spring not one strawberry plant was alive It seemed to shade and keep them so tender, that when winter set in, it completely took them out.

W. S. FULTZ: My experience with oats has been that it falls down and would not cover the row at all.

D. B. SPEER: Oats make too rank a growth. The Kaffir corn is more open and your plants have all the sun and air they need and they will make the best growth afterwards. There is a space of fourteen inches on each side where there is nothing but bare ground.

C. L. WATROUS: Will it fall over on the plants to make protection?

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D. B. SPEER: It doesn't fall over until spring. It stands up. I don't intend to cover the plants.

NOTES OF THE SEASON.

BY C. G. BLODGETT, MT. PLEASANT.

As we come together for our annual meeting once more it seems fit and proper to tell one another of our experiences, our failures and our success along horticultural lines, and as the weather is one of the greatest factors, perhaps more than in any other branch of agriculture, as it affects the horticulturalists the year round, a glance at the weather record of the past winter will not be amiss. Only the three winter months did the mercury fall to zero or below, the last two days of December showing two or three degrees below zero. January was quite mild until the last few days, February, as usual, giving us more zero weather than any other month, seven days in all, January 31s, being the coldest, eight degrees below. Then your peach buds came through all right? Yes, even some cutback seedlings, all new growth that were quite green when winter came, blossomed clear to the tips. I counted thirteen buds on a twig less than four inches in length, and the fruit came on in great abundance, considering the number of trees left us from the previous hard winter. "It is an ill wind that blows no good," is as true now as ever, for, although some of our choicest seedlings went out then, what we have left are hardy and by planting from the best we may gain in quality. Some, but not nearly all, of the budded trees were killed—a visit to the peach orchard of Calvin Calkins just south of our town proved this. There was about 300 trees mostly of Champion and Crosby. At the time of our visit, August 29th, the Champion were just in their prime and Crosby beginning to ripen. It was a grand and pleasing sight and I can assure you that seeing was not the only one of the five senses that came into action.

Some weeks later I visited the well kept grounds of Mr. J. R. Gillis, three miles southwest of Mt. Pleasant on the bluff of Skunk river. The fruit trees show much care and attention, but it was soon after the terrible Galveston wind storm and those of you who were in its path need no description of its effect on fruit trees, and those who escaped may hope never to see one. Mr. Gillis showed me a fine row of peach trees bought of one of our leading nurserymen of the state for Bokara No. 3. I am not acquainted with this peach, but from the description given in our report I cannot believe this small late peach can be true to name. Coming back by his row of seedlings I was filled with—well wonder and surprise. They were certainly the best collection of seedlings I have ever seen, some equaling or even larger than Swick's Wonder.

Can peaches be raised profitably in Southeastern Iowa? I think most assuredly yes. Depending largely on our choicest seedlings that have become acclimated we may he almost sure of a crop every other year, perhaps oftener. When they do fail that ends it for that year and there is no going over the trees for a little quarty fruit as we do some years for apples. I hope no one will think me plumb crazy on the peach question, but I believe that

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for this part of the state that Iowa seedling peaches are preferable to Iowa plums and bear fully as often, but don't carry your eggs all in one basket; and what of the strawberries? A fine crop on new vines, but on old neglected beds the yield was small, in fact the winter of '98 and '99, and the dry summer and fall following, left such plantations of little value. I am more and more convinced that for the market gardner one, or at most two crops, should be the rule. The rotation that I mentioned at the state meeting in August last has proven so satisfactory with me that I will repeat it. Plowing under and planting to sweet corn immediately after berries are gathered; the next year planting to potatoes and again setting to strawberry plants the third year. If any change, it would be one instead of two berry crops. Of varieties doing best with me the past season the Warfield, Crescent and Lovet are leaders. The poorest are Capt. Jacks and Brandywine; of the Clyde I know hardly what to write, although with me the past season it was not a success neither did it fail entirely. A fair yielder though the varieties first named were far ahead. The berries are large and of good flavor, but a great fault that few have mentioned is the short fruit stems, causing it to lie so close to the ground as not to ripen on the under side for from two to five days after the sunny side is red. A very bad fault for a market berry. For home use and a careful picking it might do. I do not like to condemn on one season's trial, but it must behave better next season or hunt more congenial company. I think I cannot be mistaken as to variety as I have plants from a prominent Iowa grower, also from Michigan pedigreed plants and they are identical.

Cannot anything be said of the apple? My friend if you had stood on a 16 or 18 foot ladder as I did day after day pulling little Janets all of which should be made into cider, and two-thirds actually were, you would dream and talk of apples as I did in my sleep. Up to July the prospects for an apple crop in my district was a fair average. Then the long hot dry weeks come with scarcely a cool night and apple growth was at a stand still especially the late varieties. Not until the 17th of September did we have rains that put our fears of drouth to flight. The Janet appears to be the only apple that was too small for the wind storm of September 11th to find, the most and best of other varieties were laid low, and many hundreds of bushels were made into cider and many others were left to rot where they fell or were fed to stock.

This has been one of the busiest seasons for the codling moth in my remembrance, most of the apples having one or more worms. I bespeak a great trade for that tree agent that has the big apple with sixteen stripes running around instead of lengthwise. He claims that apples striped thus, frighten insects away and that the wind follows around, only slightly twisting the stem, and when the wind changes it simply unwinds and is not broken off. The price of this wonderful moth and wind proof apple is only one dollar. I shall welcome this agent at the gate and just hand him my pocket-book.

Did time permit I would like to mention more fully the plums gathered November first, of the beautiful wild violets of the 2d, roses in bloom in the yard on the 4th, just a word of last springs blooming time, the fragrance of which still lingers like a sweet perfume. The delicate pink of the peach, the pure white of the cherry and plum, the red and white of the apple, the yellow and white blending so harmoniously with the bright green foliage of

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the strawberry all go to make up one of the prettiest pictures that hang on memories wall. Indeed the person who sees only the dollar beyond his efforts as a horticulturist is losing much of the pleasure, to say the least, of his labors. Such an one is likened unto the young lady who on returning from a visit to the great Columbian Exhibition on being questioned about what she had seen, answered, Oh! the Ferris Wheel.

A MEMBER: Is the Janet apple hardy?

C. G. BLODGETT: With me it is generally fair, It is my last apple to pick. I generally wait until just as late as I can, say to the middle or 20th of October:

S. C. GARDNER: I like to have the Janet apple in my orchard. It scarcely ever fails and there are no windfalls. I have known the Rawles Janet to hang on the trees until Christmas, and after the leaves have fallen off. I regard it as the best hanger on I have got, and it is a very good cooking apple in its time, which should be along toward spring.

GREAT NEEDS IN PLUM CULTURE.

BY DR. A. B. DENNIS, CEDAR RAPIDS.

Plum culture in Iowa the past ten years, made many strides for betterment, but really is very defective yet, The defects and needs I have noted for years in my own orchard are many. The one need of greater success lies in more closely adhering to our improved natives in place of experimenting with varieties from Europe and Japan, and the next step towards success lies in hardy roots for hardy tops and we cannot be too careful in making a judicious selection out of the large list of plums offered for sale by our nurserymen. I think fully one-half of the plums listed for the planter, and really this is the hardest problem to solve, how to select varieties so as not only to have the largest and most productive and best quality, but also to have a continuation of fruit from early July to late October. I have heard the statement made in this society that four or five varieties of plums were a great plenty for the plum orchard. No greater mistake can be made than to follow such advice; any one planting plums for market will soon realize he needs from twenty to thirty varieties at least, for the reason that the majority of our native plums ripen about the same season, generally in August and fore part of September, and a given variety seldom lasts over one week after commencing to pick ripe fruit, so if we have but four varieties at most ripening in succession our time of marketing plums will not be much over one month, when in fact it should run over a period of at least three months. But this is not all we lose if we follow such advice, for its a fact that out of the hundreds of natives under cultivation, all the largest and most desirable ripen close together, generally last part of August and fore part of September, so if we confine our orchards to so small a number as four or five varieties, we lose a great many of our best commercial plums. No fruit but the apple can

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be fruited for so long a period in our state as the plum, and if we are alive to their present defects and great needs in their ripening season, by creating varieties as large and good as Wyant, Stoddard, Hawkeye, Terry, Beatty and many others that will ripen much earlier and much later than these splendid varieties. It is a great error to have all our plums ripen in mid-season of our torrid weather, for you must realize that our good housewives will not stand over our hot stoves putting up plums in torrid weather, for they are all quite sure the plums will wait for their convenience, and cooler weather, but when this arrives the plums are mostly gone, and every fall there are many disappointed house keepers. I have long ago made up my mind that it is much easier to change the plum orchard, than it is to change the opinion of ladies that buy my plums, so for years I have been looking for plums that will ripen in cool weather, but this is easier said than done, for it is a fact, out of three hundred varieties, not one-half dozen are real late, and commercially valuable; so you can count all the real late plums on your fingers and have digets to spare. Mine heads the list, and I have given you the key that unlocks the secret why this old variety is such a favorite with women, it ripens late, and reaches their homes in cool mornings, Golden Beauty, Moreman and Champion, come still later. Omega as its name indicates is last, largest and perhaps best, for it ripens just when cooks want it, October 1st to the 10th. There is then a great need for more real late plums, and a large field for breeders of new and useful seedlings to supply this defect; seedlings as large as Free Silver, as productive as Wyant and as good as Whittaker, as late as Omega and Champion, and as meaty as Chas. Downing. As a rule our native plums are not meaty enough to keep and ship well a great distance and hold well after their destination is reached, I think the Miner and Wayland type of plums crossed with our hardy Americanas will give us the commercial plum of the future, possibly the Japanese if crossed with our hardy northern variety will also fill some of our great needs in our orchards. For highly colored fruit we need to cross our northern varieties with southern Chickasaw species, and other smooth skinned varieties like Moreman, Garfield, Newman, etc. Some of the more important needs of Iowa plum culture, briefly stated are first, create more real late and real early varieties so as to extend the fruiting season four months; second, plant more varieties so as not to have a break in the ripening season, as fast as one variety is gone another can be picked; third, there are plenty of good plums for mid-season, but too few real late or early varieties; fourth, we need preserving plums to take the place of the little European Damson, that never was fit to eat out of hand, but highly prized for preserving and spicing etc. We have seen in the Wyland group that are valuable for this purpose; with me these always command a good patronage for any thing the Damson can be used for, but need many more of this class. Notwithstanding these great needs, in our natives they are still the best for Iowa plum culture, and far superior in many respects at least for Iowa, than those from Europe or Japan, and this in spite that it is but a few years since we rescued them from the prairies and woods, while the foreign varieties have been under cultivation for thousands of years, this gives us a hint what the Iowa plum industry will be in the near future when man's intelligence has supplied their present great needs.

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LESSON—THE APPLE.

CONDUCTED BY E. TATUM, WEST BRANCH.

E. TATUM: In order to make it practical my plan is to find out those who have planted orchards. How many present have planted at least 500 apple trees and cultivated them and seen them in bearing?

ANSWER: F. O. Harrington, John Forster, W. A. Duckworth, C. G. Blodgett, H. W. Lathrop and W. S. Fultz.

E. TATUM: Do you find a very marked difference in soils in the greater part of Iowa?

F. O. HARRINGTON: We don't have to go off one man's farm to find a very marked difference.

E. TATUM: So that if he has a good farm he has a good place for an orchard?

F. O. HARRINGTON: If he is up high enough.

E. TATUM: There is not as much difference in soils as some folks imagine. In regard to exposure and slope, you would not stop because you didn't have a northeast slope, you would plant on some other slope?

F. O. HARRINGTON: I would not make that a condition at all.

E. TATUM: Would you subsoil.

F. O. HARRINGTON: Yes, sir.

E. TATUM: Would you plant in dead furrow, or on level?

F. O. HARRINGTON: My practice has been to plant on a level.

E. TATUM: How do you get rid of borers.

F. O. HARRINGTON: I get down on my knees and cut them out.

E. TATUM: At what age would you plant?

F. O. HARRINGTON: Two years.

E. TATUM: What system of top? The same as for an evergreen if you can get it.

F. O. HARRINGTON: Yes, I want a central body if possible.

C. G. BLODGETT: He says he gets down on his knees with a knife to hunt borers. The fruit tree planter don't want that

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question answered in that way. He wants to know how to prevent them. Isn't there someone who knows?

H. W. LATHROP: Kill off the parents, that is the only way.

F. O. HARRINGTON: If a man will look carefully every year he is not going to have very many borers.

C. G. BLODGETT: In the southern part of this district, about timber, there is a great deal of trouble with borers.

R. SHERBURNE: Along the rivers where they have perpetual feeding grounds.

E. TATUM: Distance apart?

F. O. HARRINGTON: The last three years I have planted almost entirely 15 by 30 feet. Rows close running north and south.

E. TATUM: Have you tested spraying for fruit and has it been successful?

F. O. HARRINGTON: Decidedly so this year, I think.

E. TATUM: What would be your choice of trees for home orchard, say ten varieties.

F. O. HARRINGTON: In planting my orchard I would plant more than ten varieties.

E. TATUM: I mean the ten best.

F. O. HARRINGTON: Yellow Transparent, Duchess of Oldenburg, Whitney No. 20, Wealthy, Fameuse; for late fall and early winter, the Windsor, Northwestern Greening, Ben Davis, Jonathan, and Willow Twig.

A. BRANSON: The Whitney won't sell in our part of the country.

JOHN. FORSTER No apple will do well where the ground becomes sour. On flat, level land you must drain.

E. TATUM: Would you condemn any place as being totally unfit on account of slope?

JOHN FORSTER: No, sir; not totally unfit, but I have my preference. My preference is a slope to the northwest.

E. TATUM: At what age would you set trees?

JOHN FORSTER: It depends on the size. Usually two to three years old.

E. TATUM: What form of top?

JOHN FORSTER: Form upright. If I could have my choice I would trim the north and northeast sides lightest, leaving the southwest heaviest.

E. TATUM: How far apart?

JOHN FORSTER: Formerly I tried different distances, from twenty-four to thirty and thirty-six feet. But I have decided of

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late that twenty-five feet apart is about right both ways. We can afford to set close together and if they become too close cut out.

E. TATUM: Have you tried spraying?

JOHN FORSTER: To a limited extent.

E. TATUM: Seem to be successful?

JOHN FORSTER: Sometimes our work has been a complete failure on account of a rain coming just after the spraying.

E TATUM: What soil do you prefer for an orchard?

JOHN FORSTER: I have been pretty successful on all the different soils. I don't want to give the impression that you can plant on clay soil and not fertilize and manure. You must feed the tree if the ground has not enough to supply its wants.

E. TATUM: Varieties?

JOHN FORSTER: For early I would have Yellow Transparent, Red Astrachan and Sweet June, and Wealthy to follow after the Yellow Transparent. I would take McMahon, Whitney No. 20, Grimes' Golden, Jonathan and Ben Davis, and I think I would have a few Ganos.

W. A. DUCKWORTH: I agree with those gentlemen very well, except as to the Northwestern Greening. I don't know anything about that. The Gano apple has been successfully grown in our county along with the Ben Davis. As for soil, we make soil if it is not good enough to suit us. In planting we try to plant in the natural ground as the trees grow. Of course in cultivation it is thrown up a little more around the trees.

E. TATUM: Mr. Blodgett, would you disagree in regard to these matters?

C. G. BLODGETT: I have not had experience with borers. Mine is prairie soil with a natural drainage a little to the southwest. On the west I have a soft maple windbreak, with six or eight rows on the north. I count them a damage, except when the severe apple whipping storms come. The trees are not as long lived, nor as hardy within four or five trees of that row of maples. Ten varieties does not include all that have done well in my orchard. Yellow Transparent and Red Astrachan I would not miss for anything. I would cut out the Duchess if I had to cut out any. Autumn Strawberry, Roman Stem, Grimes' Golden (a little earlier than Roman Stem), Jonathan, Minkler and Ben Davis. The Northwestern Greening I have not tried, but it is doing so well that I think it should stand on the list. Also Rome Beauty.

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E. TATUM: Mr. Lathrop, would you agree with these gentlemen?

H. W. LATHROP: I would select a white oak soil as my first choice if I could get it. The best orchards I have known have been on that soil. I would, perhaps, take Mr. Harrington's list with the exception of Yellow Transparent. I would add White Pippin to the list of winter apples.

W. S. FULTZ: I agree with everything that Mr. Harrington has said and practically with his apple list. So far as borers is concerned, I haven't seen one for thirty years. Two or three miles out on the prairie soil I find hundreds of them. We raise Iowa Blush and Black Annette. They are small, but are in demand for local market here.

H. W. LATHROP: Half of my trees should be Wagener. They should alternate other rows and for this reason, that for several years the Wagener will give a good crop of good quality of apples and be ready to retire when the others want the room.

W. S. FULTZ: I am just like Father Lathrop, only instead of the Wagener I would put Ben Davis.

F. O. HARRINGTON: I think Mr. Fultz is right. I am planting Ben Davis that way.

C. G. PATTEN: Why do you include the Windsor?

F. O. HARRINGTON: For the reason that I think it is the most valuable of any apple in its season that I know of. I obtained it fifteen years ago. They have been bearing eight years, and the trees are usually loaded heavily. The apples are of fine quality, uniform in size and shape. It has but one fault, that is, the limbs are apt to interlock, not more, however, than the Janet. I have twenty bearing trees of it. The season is from the first of November to the middle of January. Size, as large around as Ben Davis, but not as deep. They keep as well as Jonathan, and perhaps a little better. In regard to that apple, the nurserymen ought to propagate it. Every year has confirmed and strengthened my good opinion of it. It began bearing a few specimens at six or seven years of age, and bore quite well at eight years.

A MEMBER: I wish Mr. Bryant to describe the process of spraying as practiced in northern Illinois.

A. W. BRYANT: In the first place, it would be well to say something about what we spray for, principally insects and dis-diseases. I consider the two most destructive insects and diseases to fruit growers are codling moth and apple scab. The codling

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moth first comes in early apples. It bores into apples when quite small, and before long the apple will drop and then the insect lays more eggs, and these hatch out, and go into apples and cause our wormy fruit. If you can get rid of these first worms you are not going to have any second crop. We spray for the codling moth with Paris Green, and for the apple scab with Bordeaux mixture. The best way is to use both together, and then you catch everything that comes along. We spray three times each season, possibly four, and may be more. The first application should be made about the time the buds burst on the trees, and should be done as quickly as possible, and thoroughly. Every part wants to be thoroughly wet, from trunk to topmost twig. Add Paris Green to Bordeaux mixture for the second application, just after the bloom has fallen. The third application we make ten days or two two weeks later, and is followed by another if necessary in the course of two weeks.

We use the following mixture: 4 lbs. of copper sulphate or blue vitrol, four pounds of feesh lime, and four ounces of Paris Green to fifty gallons of water. Copper sulphate is best obtained of the wholesale dealer. If you have trees enough you had better get it in barrels. You ought to be sure to get fresh quick lime, and not air slacked, and you must be sure to get a good, pure Paris Green. If you buy of a local dealer you will have to pay 30 or 40 cents. We buy it in Chicago at 15 cents a pound. In mixing the solution, say on a somewhat extensive scale, prepare what we call a stock solution. Take copper sulphate, 100 pounds, dissolve in 50 gallons of water. In dissolving suspend in a coarse burlap sack as near the top of the barrel of water as you can, because the solution is heavier. Then you have copper sulphate dissolved at the rate of two pounds to a gallon of water. The same way with lime, add enough water so that it won't burn; burning will destroy the strength. Keep your lime covered all the while. You may find some trouble if your lime is not properly slacked. There will be little coarse materials in the bottom of the barrel that are of no value at all. Strain them out. For straining use a fine screen, not burlap cloth, because the particles of burlap cloth get into the solution, and into the nozzle and stop it up. When you come to putting Paris Green in water be sure and have it mixed well with the solution. Paris Green doesn't enter in solution. It makes simply a mechanical mixture. If Paris Green were dissolved it would injure the foliage. It is the soluble Paris Green that injures, but the mechanical mixture does not. The way we

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mix is to weigh out for each batch and put in a jug, and then fill the jug half or two thirds full of water, and shake very vigorously; then pour the solution into a jar or tank, and keep it stirred up well, and it will mix. When you put this in the tank you spray from, put in the lime first, and have it well mixed, and then you can put in the copper sulphate without any trouble. The best way is to fill your tank half full of water, then put in your lime, or run it in a little at a time, and get it thoroughly mixed, then put in the blue vitrol and then the water and Paris Green together. Then begin and pump right along until you get into the field. This keeps everything all stirred up. If you allow the material to settle down to the bottom it won't do any good.

In regard to appliances, I don't know about many of them. We have the Morrill and Morley pump. It is a very simple pump. All the valves are of brass and it will work a long while, if properly taken care of. You might as well get the best even if it does cost two or three times as much to start with. I recommend the getting of a brass pump. On a large scale it will take possibly three or four men to run an outfit. We use four men. In spraying you want to be very particular and cover every part of the tree, The best way is to begin at the bottom and follow right up. If you begin indiscriminately you will waste the solution.

W. H. LATHROP: Did you ever use London purple?

A. W. BRYANT: Yes, but it is not so constant and is more liable to contain soluble arsenic.

C. G. PATTEN: I understood you to say that you dissolved quite a large amount of vitrol at a time—more than you used. My impression is that the recommendations as given by experts are not to prepare very much more vitrol than you wish to use.

A. W. BRYANT: I would just make enough for one spraying, that is for the first spraying. I don't make enough to last the whole season through. Make up enough to last two or three days. We have found that four pounds will do the work just as well as six pounds, as usually recommended.

EVENING SESSION—SECOND DAY.

FIFTY YEARS OF FRUIT GROWING IN IOWA.

BY H. W. LATHROP, IOWA CITY.

Fifty years ago! Can we take into account what that means? It is half a century. Fifty years of fruit growing in Iowa comprises the best half cen-

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tury that has ever been inscribed upon the records of the world. No greater progress has been made in any other whole century than has been made in the last half century of the world's history. We are here as producers in that history, as makers of it. Our labors lie in the realm of fruit. Iowa was settled by fruit raisers. We have all come here with a taste for fruit and with some little experience in raising it. Let us commence with the fifty years. It takes us into 1850. We had been four years a state then and we hadn't a mile of railroad. Now every county of the ninety-nine is gridironed with them. Look what work has been done here in less than fifty years. We then had two members of congress in the lower house; now we have eleven. We have grown up that much in the last fifty years. What did we have for fruit at the commencement of the last half century? We had some young orchards started and we had some peach orchards started. We raised fruit in proportion to the population more than we do now. In the fall of 1850 I bought peaches at fifty cents a bushels, raised in Henry county and in the northern part of Johnson county. Following the peach right down I might say that when I came here in 1847 I brought a pocket full of pits. They were pits of New Jersey peaches. I planted them and they grew up and I had a few peaches from them, but the winters of 1855–56 and 1856–57 just wiped those out entirely. It scooped the thing so completely that we got discouraged and we planted no more peach trees. We gave up raising peaches then. We ought to have gone right on working at it, but we didn't. We thought it was no peach country. We rested for a great length of time. We rested until quite recently before we started this question of peach growing. At our last county fair in Johnson county there were fifteen varieties of peaches shown. I raised five myself in a little town lot in Iowa City.

Our apples all went out in 1855–6. We brought our fruits when we came from the east. We started here as early as 1838 when Iowa first became a territory. We had a great deal to learn. We thought everything depended on the line of latitude. That was the general principle. But there were a great many things that we didn't take into account, there were isothermal lines, elevations and trade winds. Then there was a dry atmosphere. We have had to wade through all those difficulties in fruit growing. We have had to take them up and study them one by one and sometimes we could not learn all about them. We had a new problem in 1898. Nothing in the whole half century like it and we don't know about it yet. Nature doesn't reveal all her secrets to us at once. She reveals them one by one and we get them by hard study. If we go to work diligently and perseveringly she will show us.

Now as to our orchards. When we started in we started with this variety and that variety. Where have they gone, most of them? Where is the White Winter Pearmain? Who raises the Winesap? Who raises the Rhode Island Greening or the Baldwin? We had to learn the characteristics of all of these things. We have taken up the Ben Davis. That came to us about thirty-five years ago and we thought we had something we could carry way up to the northern part of the state and raise large quantities of them. Governor Larrabee put out a large orchard of them at Clermont. But they went out. We had the sour wild crab apple. It was better sauce than boiled turnip—a little better. There were some small fruits; among them a little wild strawberry. We also had a few Isabella grapes. We were not then propagating new varieties

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of grapes and that was the only grape we had. I won't say how many varieties we have now. I think our nurserymen could give us a dozen, all better than the Isabella. That is what we have been doing in that line in the last half century.

And what have we been doing in strawberries? I guess they could name here a couple of dozen varieties that have been introduced since 1850. You can see that we have been busy, independent workers. It is just so in almost every line of fruit raising.

The raspberry, I think never was a native here. So we had to introduce that. The currant we have had to introduce too. There are other subjects that we have taken up in the history of our society; fences for example. When we began we used rail fences. We used up enough timber to build a small house to fence forty or fifty acres. Now we fence with barbed wire. Think of how we were using up timber then in fencing our farms. Now, we once in a while have a nice horse injured in a barbed wire fence, yet it is one of the most profitable things that this country ever got, even if it does occasionally scratch our stock. One of the great topics of discussion in our society used to be hedges. We spent more time on the question of hedges than you will spend now on apples or grapes or plums. I don't know what the last two years has done with all our hedges.

Now when our apples went out so completely in 1885-6 we didn't know what to do. Some went to planting seeds and thought that was the only way we could raise them here. Pretty soon an idea came up in the minds of some that if we could get hardy varieties from some foreign country and introduce them here, we would get something that our winter blizzards would not kill. So somebody went to Russia, and we got in a big lot of Russian apples. We thought those were going to be the thing and we fixed our eyes upon the Russian apples as the thing that would fill this want. A few of us got some of these trees, but the rest just sat still and waited. We waited for the development of the thing that was going to be a panacea for all our woes in the apple line. Well, it was the worst thing that ever struck us. It was a cyclone. The worst thing that happened to us in the apple line was that idea that we were going to get something that was adapted to our climate from that country. We didn't go to work as we should have done, taking our own apples here and raising a hardy variety. We didn't put our wits at work studying our climate. Take the two states north and northeast of us—Minnesota and Wisconsin. They didn't get so Russian crazy as we did. They didn't sit down and wait, but they went to work on seedling apples. Minnesota has probably a dozen apples now that are really valuable. There was Mr. Gideon that brought out the Wealthy. Where is our Iowa Gideon that should have brought out a Wealthy or something a little better, because we have a little better climate. We have but one, and he came out recently. He is C. G. Patten. Now if those Russians hadn't come here and stopped us and made us wait for developments we would have had two or three dozen Pattens, all over the state, who would have brought out their Greenings and perhaps their Russets, and found something that was worth while. I don't know how long ago we began to offer premiums for seedling apples, but where is the seedling that has been put on our fruit list? We have gone to Minnesota to get them. We are just as smart as the people of Minnesota and we have got a better climate. But

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for the very reason that we all stood gazing at this great Russian bear, we have let the last generation of men pass and our work is not done. We have got to begin and do that work, and the sooner we begin the better.

A. BRANSON: In regard to the Wealthy apple. I think it was about the beginning of 1870 or in the early 70's that Suel Foster received the Wealthy out of a whole lot of cions sent down.

THE SALOME APPLE.

BY E. TATUM, WEST BRANCH.

In taking up this subject I do it to draw out information and arrive at proper conclusions, if possible, regarding this apple. It has been before the public long enough to stand or fall on its own merits. It has been called tender and small and poor and condemned by many, but upon acquaintance with it I must say that I find considerable merit in it.

In our '96 report, page 84 we find it reported as recommended top-worked in northern Illinois. In '99 report, page 77 it is again reported on favorably for northern Illinois. In '98 report, page 83 a discussion is started as to its standing which seems to bring out two facts, first, tardiness in coming into bearing; second, fine fruit when it does bear. In *American Fruit Culturist* it is described as very good, long keeper, a valuable new western apple.

Now as to my testimony. I have three trees on low rich ground in a slough near four Iowa Blush and some Annette and Wealthy trees. I do not know the age, they are about five inches in diameter. They do not seem to have been hurt by the recent severe winters, while the Iowa Blush were badly injured (about same size). Last year they gave some nice fruit, but it hung on the tree until it was frosted and injured, but this year all three of the trees were full, about like a nice Ben Davis for beauty as they hung upon the tree and nearly as large and much the same shape, a little lighter red or more of a pink cast. I consider them very good in quality, fine grained and rich. There is a single tree across the road from my place that was a beauty to behold, leaves and fruit free from scab, clean and bright, while Rawles Jannet by its side were so scabby in leaf and fruit as to be worthless. Recently a man called to see if I could name some apples he had brought home with him from Iowa county and one of them was the Salome. He said the party who raised it was much pleased with it. Mr. Moore, two miles north of town, also has them and says they came into bearing earlier than N. W. Greening and he thinks well of them. If these observations will bring out facts from actual experience I shall feel repaid whichever way the evidence points.

F. O. HARRINGTON: I have had fifteen years' experience with that apple, and I am not very favorably impressed with it. It killed down before six years old. They are of the same age as the Windsor Chief, which are bearing from three to four bushels each year easily, and my half dozen Salomes have never borne in

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all these years, a peck of apples. I like to see a tree bear a little before that time. My Ben Davis had four bushels apiece on an average this year.

W. S. FULTZ: There are quantities of Salome apples raised across the bridge. I have talked with some of the farmers from Illinois and they are favorably impressed with it.

A. W. BRYANT: I don't feel that I ought to say much about it, as I don't know much about it down here. There are some specimens in the other room that I brought with me. For us it has borne very well. As to the quality, I don't think any one will dispute but that it is pretty good. We have planted it in considerable quantities. As far as killing out, it has stood by us as well as any other variety we have in the orchard.

W. GREENE: Does it drop its fruit easily?

A. W. BRYANT: No; it doesn't with us.

W. S. FULTZ: You met with the same loss that we did here two years ago?

A. W. BRYANT: We had a young orchard two or three years old of about a thousand trees, and I don't think we lost a dozen trees out of the whole orchard. There were a great many trees killed around us. In the county north of us one man had more Duchess trees killed out than of any other variety, and that is supposed to be one of the hardiest varieties.

C. G. PATTEN: I wish to remind my brother horticulturists that since 1893 and since 1887–8 we have had no test winters in this country, and that in the discussion of fruits that are adapted to this country we should bear that fact in mind. I tried the Salome where I live, at Charles City, as top graft and as root graft. At three years of age the old grafts were entirely wiped out. Of the top grafts I didn't lose any; neither did they kill in 1898, at all.

THE OTHER SIDE OF HORTICULTURE.

BY GEO. H. VAN HOUTEN, LENOX.

Nearly every year for so long that it seems to reach back into pioneer times, the writer has said something along horticultural lines, until, left to choose a subject, it seems hard to make a selection and really takes more time than it would to write on some topic assigned by your secretary. In selecting as above, it is not with the view of taking the negative side of horticulture, but with a view of presenting some thoughts on the part of horticulture that seems most neglected. In the past, and very properly, it

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seems to me, most Iowa writers and speakers have dwelt upon and emphasized the importance of working along practical lines until the material or result side has taken too much of a money turn; so much so, in fact, that if real results are considered, it often occurs that the best results have not been attained. In the past there has been too much of an emulation as to who could do the most *extensive* work, often at the expense of the quality of the work and consequently without reaching the best results even from the financial side. It may be that the financial side was the object, and if so there may have been some justification or excuse for such work, for the necessity existed to produce results in the briefest time possible. This tendency, however, seems to have been overdone in many cases and not the best results reached. For example, in my own first experience in horticultural work it seemed necessary to produce a crop the first season, so that there was no time to plant trees and wait for fruit, but vegetables must be grown to meet necessary outlay and pay expenses. Later a change was made and trees were planted and not for a considerable time could a thought be given to those things that did not mean financial results for the immediate or near future. Many others were similarly situated and many have continued to take this view long after the necessities that prompted such action ceased to be so pressing. In fact the material side was so long looked at from the desire for practical results and immediate, or near future conditions, that a very important part of horticulture has been neglected. This is not meant as a criticism of the work as carried on in the past, except in so far as the work was carried to an extreme.

I would have the art of the horticulturist employed for the advancement of the home and home comforts. For this purpose it is not necessary to do *extensvie* work, for in many cases it would be much better to do less and do it better; to diversify the planting and along the line of home supply rather than to try to do all on a commercial scale. Some sell wagon loads of vegetable or fruit and have not even an asparagus bed; some have large orchards and not even a cabbage patch. Some have large groves and no ornamental shrubbery, while others have great pens of fat cattle and hogs and no strawberries. In fact there has been a good deal of one-sided-farming and too much neglect of the things that would conduce to the comforts of home. This is not meant as a reflection on specialty farming, for, as a matter of fact I believe in specialties, but this does not mean exclusive farming in one line, or one kind of horticultural product only.

The successful man of business longs for the time that he can retire to the comforts of a farm home, where, surrounded by the things that make up the comforts of life he can spend his time in any way he sees fit; enjoying contact with his neighbors; having time to read and meditate and work out some of his fads and fancies. It is highly probable that he will never be permitted to do this, but all the time he is looking ahead for this (to him ideal condition) he wonders why his farmer neighbor does not take more advantage of the opportunities that present themselves to him.

There may have been times in the history of Iowa farming that the man who tilled the soil could not look forward to an immediate beginning of working out his own ideals, but the time seems to be at hand when he can do this. Conditions seem to be "coming his way" and the land owner now has the prospect of being master of the situation and the architect of his own

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fortune. The products of the soil cannot be increased to keep pace with the product of the factory and the facilities for advancing commerce, so there seems to be a bright era dawning for the farmer. It may be that at times there will be a surplus of his product, if he is confined to a single kind, but it is not reasonable to suppose that there will be an over-production for many years to come. In case times should get hard again it may be true that prices will be low and that demand will be dull, but people must *eat* and will buy things to eat before they will buy the product of the forge or the loom, so that even in times of financial depression there will be relatively a greater demand for the products of the soil than for other articles of commerce, so, that even from the money point of view, there is a better prospect for those who will diversify their industries and *intensify* their energies than for those who go along in the old way trying to out-do their neighbors in the number of acres planted, or the number of thousands of trees in bearing.

If, however, the individual has the ability and the capital to do things on a large scale, even then it is not always best to confine the energies to a single product, for diversity can be indulged in with some one or more lines of work as specialties. In fact special work often relieves, in a measure at least, anxiety as the financial success of the worker, for the crop given special attention may be out of the way in time to give plenty of leasure for investigation and study and indulging the inclination in other lines for improvement or pleasure. If such is the case, or in any event there should be time for study and improvement both mentally and in a material sense. In fact no business should be engaged in that prevents mental and social opportunities.

Especially should the horticulturist strive to do those things that will add to the comforts and pleasures of home. This is an art that should mend nature. The waste places and the out-of-the-way places should be reclaimed and beautified and especially the home surroundings should be made attractive. A little here and a little there, with suitable trees and shrubs planted in proper places and given proper care, will add much to the pleasures and comfort of home and even in a material way will be of advantage. The home that is thus made beautiful will have a commercial or selling value much greater than the extra cost and yet the expense need not be great. It is often true that the work is done on too extensive a scale to look well or produce the best results, and many a farmer and horticulturist makes a mistake in planting too extensively and not doing the work with that skill and care to produce the desired results. In fact it is often that half or even one-fourth of the work done and done right, would produce much more desirable results, and at much less cost than as we see it done. In all kinds of work it should be the aim to do what is done in the best possible manner. The time is coming, in fact is here now, when to succeed in the sharp competition in the best manner, the very best talent and best education should be brought to bear on all the problems of work and business. The ideal way is to perform the work in the least time consistent with good work, with the least outlay consistent with results desired—in other words to so do the work that there will be a profit, not only from the financial or money side of the transaction, but from the side of satisfaction and comfort.

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An orchard of 100 trees of best varieties in good health and properly managed will give better returns and more satisfactory results than several hundred of indifferent varieties and in poor thrift, as they will surely be under neglect. The city or town lot need not have so many trees and shrubs, but there should be a wise selection and proper arrangement to produce the desired results. In fact in most of the older towns of Iowa we see two or three times as many specimens planted as the space will justify. Mistakes can in great measure be corrected by a judicious use of the ax, saw and pruning knife, but it seems hard to cut down trees that we have seen grow to magnificient proportions. Somehow they remind us of old times and we remember the time when they were of real value in arresting the wind-sweep, or by giving grateful shade and, although they may have lived beyond the time of need, we hesitate to destroy, waiting until a later day when we imagine the task will be easier; meanwhile the struggle goes on and nature is striving to correct the mistake that we made in planting too many, or in leaving the ones planted in excess of after needs to survive, until they become an incumbrance to the ground and injure the ones on which we should depend in the future for the effects desired.

Landscaping, home adornment, architecture and many other things become necessary as a country grows older. Such things receive but little attention in pioneer times, but Iowa has now passed beyond the pioneer age and has come to a place where development should be seen on every hand. Our towns and cities, and even the country, show considerable progress in the way of the adoption of better methods. In the cities we see more modern styles of architecture; we see more efforts at ornamentation and providing conveniences, and in buildings in the country, we see more rapid improvement in this direction than we do in horticultural work. It is easy and often all right to copy a building, or a hint may be had from some other arrangement of buildings with regard to conveniences, but an attempt to copy horticultural effects would hardly succeed unless the lay of the land, the size of the grounds and other things were alike or similar, which is seldom the case; so, in preparing and planting for horticultural improvement we can not often gain much from seeing other places, in so far as laying out our grounds, but we can get hints which will enable us to make beautiful and convenient arrangements. We can get hints as to varieties, groupings and the laying out of walks and drives that will, while not copying other effects, yet enable us to produce good results for ourselves. As between planting too little and too much the prevalent mistake is to plant too much. Fewer specimens and better care will, as a rule, give better results, require less outlay, demand less time and attention and will enable any changes to be made that may be desired without the removal or destruction of work already done, as is often required if too many trees and shrubs are set. A good lawn is essential to best effects, and there should be clear places where there are no trees or other obstructions to the view, and the perfection of the lawn cannot be reached unless there is some ground left without trees. Again, the sun is essential to health and comfort, and too many trees materially lessens the beneficial effects of this life and health-giving power. So, the conclusions reached by the writers that while tree-planting should be encouraged and insisted upon, yet judicious selection, proper arrangement, proper care, and the general development needed to be studied with as much care.

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The plans should all be considered from the standpoint of what will produce the best influences and effects for the home, not what will produce the most money ten or twenty years hence, for it is better to produce good results and enjoy them than to plan for future generations, as commendable as that kind of work would be. It is well to be a benefactor but it is more beneficent if the immediate results can be as desired than for others that you may not know how to reap the benefits of your labor. This is not an appeal to selfishness, but an appeal to so live and so do that those in whom you have the most interest may get the greatest benefits from the results of your outlay and labors.

The time has come in Iowa for a higher type of Horticulture, for better work, more *intensive* if not less *extensive* work, for quality rather than quantity. Experimentation should and will go on, but those who seek to secure immediate results and produce best effects in ornamental horticulture should separate their fads and relegate them to the experimental efforts, and in such a way that the wreck of their hopes would not litter the lawn or intrude on what should be the pleasant places of earth. Many of the mistakes of the past were unavoidable, for much of our planting was experimental, on account of lack of knowledge as to the value or behavior of varieties, but much has been learned in the past, and we can count with reasonable certainty on enough to meet the requirements of the orchard, the vineyard, the fruit garden and the lawn, and if planters will seek and profit by the advice of our horticulturists and not be led astray by the stories of interested tree-peddlers the results of the near future will be so marked and so beneficial as to gratify all land owners.

THIRD YEAR'S EXPERIENCE IN STARTING A COMMERCIAL ORCHARD.

BY R. E. HINDS, OTTUMWA.

Business principles are founded upon conservative facts and figures, and although uninteresting to many they have their place with the few who are inclined toward the commercial side of orcharding.

The commercial orchard is planted for profit, and to be made a success must be followed in all details with a stoical persistency. The natural elements to which we consign our labors, and over which we have but little control at times, play sad havoc, leaving us with 50 to 80 per cent of our trees killed outright and the remainder black hearted and diseased. We try again, believing that the next cannot be worse, and so hopefully and cheerfully transplant, and await the few years that are to follow when we are to be repaid by the picking of the big red apple only to market the same upon a glutted market with depressed prices. This hope is nice to feed upon, but will it in the future repay the six years outlay and labor bestowed upon the planting while bringing it to a successful fruiting age. Believing there is a need for the *dollar* and *sense* side versus the hope and enthusiasm side of orchard planting I submit figures collected during my first three years experience, which are as follows:

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New tools and repairs	$ 12.75
Board and horse feed while working	54.20
Labor paid for outside of my own	22.30
Cost of labor of one horse	12.00
Rent on 12 acres of land	29.63
Chemicals used in spraying	5.25
Rye, clover and buckwheat for cover crop	8.25
Paper and string for wrapping trees	1.00
Horticulture, papers and meeting	10.90
Hauling manure	4.00
Cost of trees, plants and vines	66.46
Total	$226.74
Inventory, one cultivator	5.00
Net cash outlay for 1900	$221.74
Net cash outlay for 1898 and 1899 as shown by page 242 of 199 report	$262.39
Total	$484.13

This amount represents the net cash outlay for 914 trees, one-half acre of currants and gooseberries, one hundred grape vines and 3,000 apple grafts all in growing condition. The apple grafts, as I have grown them, will not exceed $35.00 over the expenses of the orchard proper had I not have grown them. This being deducted leaves the cost for 914 trees $449.13 or 49 cents per tree. This does not include my own labor nor an amount of $173.46 which I spent in stump pulling and improving my orchard plots. As I have adopted the clean culture method, I have no profits from the ground and besides have paid to have manure hauled on to it with a hope of future returns. I tried a cover crop this year which pleased me better than the buckwheat I sowed last year. It was rye sown August 1st broad cast at the rate of one bushel one peck per acre. It made a good growth and a nice cover. It is as cheap as buckwheat. The rye at 45 cents per pushel seeded as above, makes the cost about 56 cents per acre. The buckwheat is seeded at the rate of three pecks per acre, and at 75 cents per bushel, makes the cost 56 cents. The one horse implements I have bought are simple and few, but I would not make any changes if I were to buy again. With the eight inch diamond plow I can get around the trees close enough so that with my five tooth planet cultivator I can get the small block left around the tree after having cross plowed the orchard with the diamond. I have not used a smoothing harrow on account of lack of time. I have managed to cultivate through the orchard every two weeks and among the 3,000 apple grafts every week. I have had good growth on all trees, averaging 16 inches on the Willow Twig, Jonathan and Ben Davis. With spraying, pruning and hunting borers I have had all I could do. This fall I tied all trees against the rabbits with paper. I also used the wood veneer wrappers but prefer the paper. I am at present wanting more advice on the use of the Kerosene emulsion and its application as I fear the damaging of the leaves on account of an improper strength of the solution. I buy my chemicals at the following prices:

Kerosene oil, 10 cents per gallon; copper sulphate in 100 pound lots, 6½ cents; London purple in twenty pound lots, 13 cents; Paris green in twenty

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pound lots, 15 cent. Next spring I expect to use white arsenic solution as it is claimed to remain in suspension longer than Paris Green, on account of being lighter. In spraying with Bordeaux mixture I find for a tree six years old from the root grafts that it requires a quart of mixture per tree or 200 trees to a fifty gallon barrel. I have not had much trouble with field mice, but would like to know how to catch the gopher and the mole. I find the apple scab hard to control by spraying, and especially on the Jonathan variety. I can say that I am sure that my foliage has a deeper green and a healthier appearance on the sprayed than unsprayed trees.

I have made some mistakes which I can yet remedy, such as cutting out the limbs making forks from the main trunk, but with all I am encouraged over the result of my labor and money expended and await the return of spring to more thoroughly put in application the knowledge I may gain.

C. L. WATROUS: I wish to tell Mr. Hinds what to do with the trees gnawed by rabbits. Go in just before the frost is out of the ground and cut them as close to the ground as you can and let them throw up new shoots and you will not suffer any particular harm.

MORNING SESSION—THIRD DAY.

MY HORTICULTURAL TROUBLES.

BY JAS. R. GILLIS, MT. PLEASANT.

I do not write this paper to excite your sympathy. I only write it to warn some would-be fruit raiser of the difficulties that lie in his path. I cannot remember the time when a lucious apple would not make my mouth water, and I have striven for many years to situate myself so that I might have an abundance of this lucious fruit. I have lived nearly twenty years where my home now is. The year preceding my coming here had been a good apple year and there were 125 bushels of nice apples piled up in the cellar when I moved onto the farm. The trees had been planted thirty or more years before I came and I had an idea that I should be in clover, but the next year was not an apple year, nor the next, and instead of apples to sell, I had few to eat. Meantime my old apple trees began to decay, and in spite of pruning out dead limbs, and plowing and manuring, my apple trees died. Their race was run; one by one, like aged patriarchs, they laid them down to rest, and now these old wrecks are all gone.

This would not do; apples I must have. Along came the ubiquitous tree agent with his beautiful pictures and loquacious tongue. I bit, I bought, I was bitten. I had made little study of varieties, did not know what I had bought, nor do I yet know. Some of the trees died between the nursery and the farm; it is impossible they were dead when they left the nursery. Some made a sickly struggle through the first summer and then gave up the ghost. The borers got a few, the festive cotton tails some others, some still live to

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tell the tale of deceit and fraud practiced by the agent. I have only four trees out of some sixty that are of any value.

Not being content to give it up so, and still not having the fear of the tree seller before my eyes, I determined to fly my kite again. I bought trees again. This time I kept a record of what I bought, to-wit:

Fifty-two Northwest Greenings.
Twenty-six Rawles Janet.
Twenty-six Iowa Blush.
Nineteen Ben Davis.
Four Walbridge.
Three Willow Twig.

These trees are bearing now. My Greenings proved true to name. The Janets also, except two trees of an unknown and nearly valueless kind. The Iowa Blush were all right. But I did not have a Ben Davis in the lot, and only one Willow Twig, and the Walbridge is worthless. In place of Ben Davis, I got partly Grimes Golden, one Roman Stem, and some unknown kinds of little value. The orchard is rather pretty to look at, though some of the trees are dead and others dying. I had few apples last year, but great promise this spring for an abundant crop. I sprayed my trees with kerosene oil before growth began; when in bloom I sprayed with combined Bordeaux mixture and Paris green, and after the fruit was formed I sprayed with Paris green and I thought to myself, now I'll have fruit that will be fruit; no worms for me. I had hauled out considerable manure on my orchard; I plowed and planted pumpkin seeds, as recommended by Prof. Craig before the society at Mt. Pleasant last year. My orchard in bloom was a sight to delight the eye, when cleared of bloom and the young fruit was set it excited the liveliest anticipations. I thought my cellar would be full of fruit, perfect fruit, and my pocket full of legal tender. But alas! for human hopes.

In August the fruit began to fall, it grew thinner on the trees and thicker on the ground. The August and early September suns seemed to fairly cook the fruit on the trees. Then the tail end of the Galveston gale came around this way and for about twelve hours pounded the poor trees, and piled the precious fruit, still unripe, on the ground. Nor had my spraying served its purpose, almost every apple contained a worm, some of them two or three. And now I have a lot of wormy rotting apples in my cellar.

I had not lost heart two years ago and as apple trees were very cheap and I had a piece of land that I thought well adapted to orchard purposes, I bought six hundred trees. One hundred Grimes Golden, one hundred and fifty Jonathan, the same of Ben Davis and two hundred N. W. Greening. I got these trees direct from a nursery at a cost of three cents each for one year old trees. They all grew the first year although the grasshoppers ate them badly. I planted the orchard to corn. The winter of 98-99 killed some of these trees, about one hundred of them.

The worst sufferers were the Ben Davis. I lost nearly four times as many of them as of all the rest. But now I have trouble here. The orchard is on a side hill. I had plowed and harrowed the ground in splendid condition to plant corn. Had it check rowed and was planting it by hand. Before I got it planted we had one of those terrific thunder storms that sometimes come. Immense quantities of water fell in a short time and my

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field was washed into ditches that are bound to trouble me for a long time to come.

I planted at one time and another 125 pear trees. Of these I have some twelve or fifteen that are of any value. Most of them have blighted and the fruit this year suffered from both worms and wind. Some years ago I planted a row of peach trees. I planted the seed where I wanted the trees to stand. Two years ago I had a fine crop, but the cold winter caused havoc. I concluded the tops were killed if not the roots and cut them back severely. They were very short bodied trees, the limbs starting in some instances within ten or twelve inches of the ground. I cut all the large limbs to within three or four feet of the ground and trimmed off nearly all the small limbs. Each tree presented the appearance of a few naked stubs. I did this in the latter part of February. Some of the trees died but the major part of them are alive and present a fine appearance and while they did not bear heavily during the past season there were considerable quantities of fine fruit. The Champion and Elbertas planted two years ago were all winter killed. At the same time I planted twenty trees bought for "Bokhara No. 3." These proved to be very hardy and bore some fruit this season.

The fruit was a rather small, pleasantly flavored free-stone and ripened late in September. I sent some specimens of the fruit to our Mr. I. N. Elliott, who pronounces it anything but "Bokhara No. 3." He says that "Bokhara No. 3, ' ripens in July and August—is a cling stone and is of comparatively little value. The catalogue of the nursery man of whom I bought says: "We have the genuine Bokhara No. 3," and says that many of his competitors have not the genuine article. I once bought some plum trees of an honest tree agent, (anyway he said he was honest). I paid him the paltry sum of $5.00 for six trees. These trees were guaranteed to be the finest. Unfortunately for me these trees all grew. They were not worth a continental. The trees were well enough—but the fruit was little measley stuff that we could not use. I cut these trees down and burned them. I expect the agent is burning too—he's dead. The Wild Goose plums I planted were killed by the hard winter of '98-99. My Weavers went the same way. I set out two Lombards—my how they grew—they are now 15 or 18 feet high—one of them is—Every spring they are loaded with bloom—every summer they are loaded with fruit, and every fall every last plum of them rots before it ripens. I have never had one single specimen that has ripened. I planted some Miners—they are hardier and bore fairly well.

Such kind friends is a portion of the troubles that bear me down in my horticultural pursuits. If you should meet a man—pre-maturely old—bent, withered and gray—unkempt—unshorn—with a wormy apple in one hand and a rotten one in the other—that's me. It will pay you almost as well to search for the "Golden Fleece"—the "Philosopher's Stone" or the "Spring of Eternal Youth" as to try to raise fruit in Iowa. But let us keep on planting trees.

On motion the following resolution was unanimously adopted:

We commend and endorse the educational work of State Secretary Greene and hope it will be continued and developed in coming years.

H. W. LATHROP.
M. E. HINKLEY.
C. L. WATROUS.

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LESSON—SMALL FRUITS.

CONDUCTED BY ABNER BRANSON, NEW SHARON.

A. BRANSON: Mr. Blodgett what varieties of strawberries would you plant?

C. G. BLODGETT: Warfield with the Lovett for fertilizer. I know them to be good.

W. O. WILLARD: Bederwood.

W. H. GUILFORD: Enhance is very much liked at Dubuque. I find it a success. It is not as well known as it should be.

JOHN FORESTER: Cyclone.

W. O. WILLARD: I think in naming varieties we should tell the district.

A. BRANSON: The names are given in the reports and from that we can tell what part of the district is reported.

C. H. GARNES: Parker Earle.

A. MEMBER: Has anyone had experience with the Gardner?

W. GREENE: It has not proven productive with me.

W. O. WILLARD: Nor with me?.

J. C. STUART: With me the Gardner blighted badly.

A. BRANSON: Preparation of ground?

S. C. STUART: The same as for any garden crop.

A. BRANSON: That is a good answer. It covers the whole ground. What distance apart?

J. C. STUART: Rows four feet apart; two feet apart in the row.

A. BRANSON: I noticed in Mr. Speer's paper that he said strawberry plants should be planted in rows 3 ft. 8 in. apart. Would anyone plant closer than four feet?

C. G. BLODGETT: Four feet is my rule and 2½, sometimes three in the row, according to variety.

A. BRANSON: After culture was given very well in the paper. Preparing the ground for raspberries?

W. T. RICHEY: I prepare ground very much as I prepare for corn. It needs thorough preparation, deep plowing, and the soil thoroughly pulverized.

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A. Branson: What varieties would you plant?

J. C. Stuart: It depends on whether I wanted early or late berries. For early, Palmer's seedling and next Kansas and Older. The Gregg doesn't do well with me.

W. O. Willard: Eureka in the place of Palmer. The Older, Gregg and the Kansas.

F. O. Harrington: I would plant Cumberland, and next Kansas.

H. H. Michener: We like Older. With Gregg we cannot get a regular crop.

Mr. Kemper: Kansas and Gregg. Palmer I have discarded altogether. Gregg is pretty fair; Kansas also.

A. Branson: Have any new varieties been tried? Any that are good?

F. O. Harrington: I have tried the Conrath, but could not report favorably yet.

A. Branson: Who has fruited the Wallace?.

C. G. Blodgett: I had three plants sent me this last year. One I think is alive and fruited.

A. Branson: How did you like the fruit?

C. G. Blodgett: It is mixed a little. I think it is a cross between red and black. A person that likes red would like the berry, and a person who likes black would like it. If they disliked either they would dislike it. It is soft and not a market berry.

A. Branson: I planted one hundred and got sixty to grow.

W. T. Richey: I had three and one fruited. It was not as vigorous as Columbia Red. It is smaller and I don't consider it nearly as good a berry.

C. H Garnes: I have a vine which sprung up in my vineyard. From this one vine I have picked one quart of berries the first picking. It is nearly equal to the Kansas. It was grown in ground not cultivated at all. I think that is a pretty good showing for a seedling. This year I am going to take pains with it.

A. Branson: What varieties of blackberries would you plant?

F. O. Harrington: Snyder and Stone's Hardy.

W. T. Richey: We plant only Snyder. Stone's Hardy almost invariably rusts. One of my neighbors planted Stone's Hardy and Snyder side by side. The Stone's Hardy is a finer berry but bears only about once in five or six years, and is distributing rust over the entire neighborhood.

A Member: Has the Eldorado been tried?

A. Branson: It does fairly well but not better than the Snyder.

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W. S. FULTZ: Stone's Hardy is preferable to Snyder. It is a finer, nicer berry. It comes later. It came so late that prices had gone down so that we didn't consider it profitable. It is more subject to rust than any other variety.

F. O. HARRINGTON: I have never seen a particle of rust on mine in fifteen years.

C. H. GARNES: Could we not get better results from blackberries and orchards by raising together. In my patch where there are apple trees is where I get my blackberries.

A. BRANSON: That is the way I have planted for twenty years.

MR. KEMPER: The trees shade the blackberries in the winter, and in this way I have blackberries every year.

JOHN FORSTER: I seriously object to planting blackberries in an orchard. They are so thorny and hard to get around. When the orchard is bearing you still have those vines coming up. I am trying to get rid of mine.

A. BRANSON: When the orchard comes into bearing we mow them down.

JOHN FORSTER: Here is the serious objection. You set your vines out in the orchard and it is a harbor for every pest that comes around. The rabbits, the ground mice, and every other pest locates in brushy places. I would much rather cultivate my orchard to some crop, as potatoes, melons, etc., or I can put in a crop of oats. If I want to enrich my soil I can turn it under, thus making a good coat of manure.

A. BRANSON: Plan of trimming.

W. O. WILLARD: When the new growth is up about two feet I simply nip the top cane. That is about all I do. As a general rule I don't do any more pruning. The next spring I trim the laterals back to about one or two feet according to strength.

A. BRANSON: Do you use the same system on blackberries as you do on raspberries?

W. O. WILLARD: About the same—that is for summer trimming.

W. S. FULTZ: I might make a remark here. I used the same system that Mr. Willard does up to within the past four or five years. One year the Snowy tree-cricket got very bad and almost ruined our patches. I made the discovery that when the cane had got to a certain age or size the cricket didn't sting but went further along. So I came to the conclusion I could do better not to trim. I don't have to cut back as far to get rid of the deadwood killed by the sting. I believe you do better to get all the growth of

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wood you can. I have practiced for more than twenty years growing orchards in young blackberry patches. When the apple trees get old enough to bear I take the blackberries out. There are two ways. One is to make a hog lot of it, if possible, but never more than a couple of acres at a time. The hogs help me immensely. Another way to get rid of the blackberries is to mow them off and plow and let the ground lie until about the 25th of June, and then put in buckwheat, or Hungarian or millet, or something dense. It is very little trouble to kill them out. It don't take but a year or two under this system to get rid of the blackberry plants.

JOHN FORSTER: You will find it hard work to get up close to those trees.

W. S. FULTZ: I have to use a grubbing hoe of course.

C. H. GARNES: I pay large rent for a small thirty acre farm and as I wanted to know the best method I asked advice about trimming blackberries. One man said, "You have a pretty nice growth of wood. I don't believe I would trim back too much." So I trimmed just the tips off of all but one row. On this row that I didn't trim anything off I had as many berries as I had off of four others.

W. O. WILLARD: I simply pinch the top off. It is not trimming, but simply stopping the terminal growth.

C. H. GARNES: There is where the insect works.

JOHN FORSTER: When did you trim the blackberry back?

C. H. GARNES: Along about the first of July. You cannot do all in one day. I went through every time when I was picking berries.

W. O. WILLARD: I think this question of trimming depends upon locality. Where they are not perfectly hardy I think you ought to keep the new bearing shoots as close to the ground as you can.

F. O. HARRINGTON: It seems Mr. Garnes' most serious objection is the depredations of insects. I find they bore anyway whether I trim or not. So I pay no attention to the Insects. As Mr. Willard has suggested it is an important point to harden the the cane and we must resort to pinching or else we don't have success.

C. H. GARNES: Whenever you check nature, doesn't it take nature much longer to recover? When you cut off the head, don't you check the growth just that long?

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F. O. HARRINGTON: That may be logical, but I don't think it is borne out in practice. With the cane tipped off at two and one half to three feet you will have full side branches inside of ten days.

PERSIMMON REPORT.

BY F. O. HARRINGTON, YORK CENTER.

If I remember rightly, at our last yearly meeting, I promised that I would report progress with the persimmon, at this time, if I had made any. That is to say if I had made a failure, I would be silent on the subject. I am pleased to report that I have no tale of woe and discouragement to conceal, so I will report briefly. During the summer of 1899 I grew seedlings from persimmon seed that had been stratified out doors for freezing. These were not planted until after the middle of May, when they began to sprout. They were planted in five rows, four feet apart, and five inches apart in the row, and as none but the sprouting seed were used, there were no failures of the stand, save that occasionally the cut worm got one, later. They made on the average probably 16 inches growth and fairly stocky. Late in fall the earth was slightly thrown against them, and later three rows out of the five were heavily mulched with probably four or five inches of straw, rest not mulched at all at first, but later a part were mulched with very thin coat of straw. Result of the experiment, was that this spring the three rows of well mulched trees were perfect in condition, the others nearly all dead. I am satisfied this would be the usual result with persimmon seedlings on gound kept entirely bare by clean culture and left in that condition. I have long observed that the first winter was a critical period in the life of seedlings of many trees. If those coming under my own particular observation in this respect, I might name the apple, peach, osage orange, chestnut, etc., hence my mulching of the persimmon, which I am planting a hundred and fifty to two hundred miles north of its natural habitate. I shall take the precaution to either bank up or mulch the young trees, which I expect to set in orchard, the first winter. Afterward I think they will get along in the battle with old "Boreas," at least I can no longer fight the battle for them. The three rows left in good condition in nursery, I grafted about middle of May with some twenty-five varieties, the best I have been able to obtain, that were grown near the Northern limit of the persimmon belt, in order to get the hardiest, for experimenting with. It is well known that a tree or plant, by seedling production with man's aid and selection, will gradually acclimatize itself much farther north than the latitude in which it is indigenous. If hardiness were the only desideratum in this question, it would be a simple matter, but we want the quality as well. The success of present season's grafting was not quite so good as two years before, yet fully 75 per cent of the grafts, some eight hundred and twenty-five in number, grew, and in the main have made fine stocky trees, from eighteen or twenty inches up to, in a few instances, five feet. I have dug up about three hundred and fifty of the best of these, and buried deeply enough, that no frost will find

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the roots this winter, unless very severe, without snow. Of these I expect to plant in orchards something like two hundred and fifty or three hundred. They will nearly all be planted in what has been artificial grove that has been killed out two or three years, but cannot be plowed, so have dug up a space for each tree, four feet wide, and will mulch as quickly as planted in in spring, and lightly for at least two or three years following to keep down grass and conserve moisture. It seems peculiar that others find so much difficulty in successfully grafting small persimmon in nursery propogation. See persimmon article in last year's horticultural report on this point. A few weeks ago I received a letter from Mr. James P. Little of Cartersburg, Ind., the persimmon specialist of Indiana, in which he congratulates me on what he is pleased to term my "good success" in persimmon grafting and continues, "certainly your good luck has no precedent. Well I have the same old story to repeat to you. I took more pains, my wax never better, my cions never in a more perfect condition, stock the very best, cions put in the best season, my faith was never stronger, but still I made a bad failure." He thus describes several methods of grafting tried, etc., and referring to his cousin, Mr. Hobbs, president of the Indiana State Horticultural Society, and member of the large nursery firm of Albertson & Hobbs, the only firm who have been offering grafted persimmons to the trade, he writes: "I saw Mr. Hobbs, of the Bridgeport nurseries, and he told me they had the worst kind of a failure in grafting their persimmons, the great problem is why you succeed, and everybody else fails?"

I am not vain enough to suppose I can do better grafting than other men of like or greater experience, so I say it seems peculiar and somewhat puzzling, I tried a little budding of the persimmon at two different periods late in the season, but the result was only failure; however, I expect to give it a more careful trial next summer.

W. H. GUILFORD: We generally make a great many failures and very few successes. I am very glad, indeed, that Mr. Harrington is among us as a specialist on the persimmon, and believe the fruit can be brought a great deal farther north than it is.

S. C. GARDNER: To what extent have you utilized the persimmon as a table food? I came from a country where we had the persimmon growing wild and I didn't know there was any nutritive quality about it.

F. O. HARRINGTON: I can say this much, that they are becoming very much sought after in our market—even wild persimmons shipped from the south. It is very difficult to get them. There is no other known fruit that contains more nutriment than the persimmons, and it is richer than any fruit that grows on this continent. You can keep it all winter. When better known it will occupy a permanent position as a fruit for household use.

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RECOMMENDED FRUIT LIST.

APPLES.

Summer: Oldurburg, Red Astrachan, Autumn Strawberry, Dyer, Whitney No. 20, Yellow Transparent.

Full: Longfield, Fameuse, Maiden Blush, Wealthy, Dominie (south), Wagener, Utter.

Winter: Ben Davis, Willow Twig, Northwestern Greening, Jonathan, Rawles Janet, Grimes Golden, Roman Stem, Allen's Choice, Minkler, Ramsdell Sweet, Gano, Black Annette, Scott's Winter, Rome Beauty, Stark, White Pippin, Seever's Carthouse; Windsor (for trial.)

PLUMS.

Natives: Wyant, Hawkeye, Miner, Wolf, Stoddard, De Soto, Forest Garden, Pottawattomie, Wild Goose, Whitaker.

Domestica: Lombard, Blue Damson, Moore's Arctic, Canada Glass, Tatage.

GRAPES.

Black: Concord, Worden, Moore's Early.
Red: Brighton, Agawam, Woodruff, Wyoming Red.
White: Diamond, Pocklington, Niagara.

CHERRIES.

Early Richmond, English Morello, Montmorency, Wragg, Dyehouse.

PEARS.

Kieffer.

PEACHES.

Friday or Bailey, Champion, Crosby, Elberta, Lone Tree; (for trial).

BLACKBERRIES.

Snyder, Stone's Hardy.

RASPBERRIES.

Black: Palmer, Souhegan, Gregg, Older, Kansas, Eureka.
Red: Loudon.

GOOSBERRIES.

Houghton, Downing, Champion, Red Jacket.

CURRANTS.

White Grape, Fay's Prolific, Red Dutch, Pomona.

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STRAWBERRIES.

Crescent, Bederwood, Haverland, Warfield No. 2, Bubach, Jessie, Parker Earle, Brandywine.

Committee on place of meeting reported in favor of West Branch for the annual meeting to be held, November 19, 20, and 21, 1901.

AFTERNOON SESSION—THIRD DAY.

ASPARAGUS CULTURE.

BY J. E. HOOPES, MUSCATINE.

The culture of asparagus has increased so rapidly in recent years that it is attracting considerable attention. The plant grows wild in the salt marshes on the Southern coast of England and very likely originated in that section. It is grown extensively in private gardens as well as for market. Asparagus prefers a rich, loose, sandy soil with a subsoil which is best suited to retain moisture. A loose gravel or heavy clay is not desirable. As to manner of planting either for market or private garden, we would recommend to first give the land a liberal coating of fertilizer and plow deep for this is the last opportunity to thoroughly stir the ground as a good bed should last twenty to twenty-five years. Then furrow out with a large single shovel plow or lister in rows five to six feet apart. Set the plants fifteen to eighteen inches apart in the row and four to six inches below the surface of the ground. It does not do to crowd this crop. It may seem a waste of land for the first two or three years, but in time it will pay by yielding more shoots and of a larger size, which is very desirable. Plants used are one or two years old as preferred. These are grown from the seed for this purpose. Be careful to plant them well for a poor stand is a loss in every way. Our method of cultivation is about as follows: As soon as the frost is out in the spring plow from the rows so that the sun heat can get down to the crowns to start the asparagus to growing, being careful not to expose the crowns too much as the shoots do better if growing through about four inches of soil. Then we cultivate on top of the rows with a one horse harrow to pulverize and level the ground. This is all that is necessary till after the cutting season is through, when we use a stirring plow and throw the dirt to the rows so as to cover up seeds that may be growing among the stocks. Keep the ground between the rows well cultivated during the balance of the season and should any weeds appear in the rows cut them out with the hoe. We let the summer's growth of tops stand till time to prepare for the next crop, when we clear them off and burn them. The time of applying the fertilizer, generally barnyard manure, is not important. Some prefer after the cutting season and others in the fall or winter. If spread in the winter it is best to put it on the rows as it then serves as a mulch to protect the crowns from hard freezing, removing it in the spring and plowing it into the centers. Nitrate of soda and salt are also used at the rate of 500 to 1,000 pounds per acre as a fertilizer.

Do not plant a field of asparagus and let it alone to see how near the

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weeds can choke it out, but if you expect to make it successful don't be afraid to cultivate it thoroughly.

H. HARRINGTON: What distance apart do you put the rows?

J. E. HOOPES: Five to six feet, and fifteen to eighteen inches in the row.

A MEMBER: Do you ever grow anything between the rows the first year?

J. E. HOOPES: You can grow an early crop the first three years—a short lived crop.

A MEMBER: What time do you cut the old growth away, in the spring or fall?

J. E. HOOPES: If you don't fertilize your field before spring it is usually best to leave the brush stand until spring, as it acts as a protection.

A MEMBER: About how many years do you expect to be able to cut it?

J. E. HOOPES: It depends largely upon how it is taken care of. We have beds twenty-five or thirty years old that are doing well. I presume they will last until fifty if well taken care of. I think it might be best to plant every twenty-five years.

A MEMBER: How long do you cut? When do you stop cutting?

J. E. HOOPES: There is no strict rule. Some quit when the market breaks down. The best rule is never to cut after they begin to decrease in size. If you do so you are generally cutting yourself out of pocket the ensuing year.

A. BRANSON: Do you have any trouble with seed coming up in old beds?

J. E. HOOPES: It comes up all over the same as weeds, but they are easily destroyed.

A MEMBER: Do the birds carry them off and plant them in the orchard?

J. E. HOOPES: Certainly.

A MEMBER: Do you think it necessary to plant them deep?

J. E. HOOPES: Yes, sir; I do, so as to protect them from both drouth and frost.

A MEMBER: What kind of soil is best?

J. E. HOOPES: Mine is sandy soil.

A MEMBER: Would you set as deep in black soil?

J. E. HOOPES: I have had no experience in black soil. Better not set quite so deep.

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R. E. HINDS: How deep below the surface do you cut tender sprouts?

J. E. HOOPES: There are two classes, the white is cut sufficiently deep to get all of white color. Then we have what is called the green. This is cut above the ground. We never like to have it broken off.

A MEMBER: Can any use be made of the seed?

J. E. HOOPES: Yes, sir; I gather all the seed I can and furnish it to the seedmen. I have taken as high as $12.50 to $15.00 an acre for the seed crop. I have about twenty-five acres in bearing now. I cut every day except Sunday.

A MEMBER: What is the probable income per acre?

J. E. HOOPES: I don't like to do too much Yankee guessing.

S. C. GARDNER: Do you find a market in this city?

J. E. HOOPES: It is all shipped. At the beginning of the season it brings about $2.50 a box; later from forty to fifty cents. After that it doesn't much more than pay expenses.

A MEMBER: Would it be practical for family use to let stalks grow the early part of the season and then cut afterwards, say in July, and so have asparagus in the fall?

J. E. HOOPES: I have never tried that, but I have heard that it is done. A gentleman told me that up in Milwaukee the gardeners have what they call fall cutting for market. We have never done so.

WM. LANGHAM: You can make enough the first time can you?

J. E. HOOPES: There is no shipping demand for it at that time of the year.

A MEMBER: Do you think it would injure the plants permanently?

J. E. HOOPES: I would say this, and Mr. Kemper thinks so, too, I think you would weaken your shoots for the next spring.

SWEET POTATO CULTURE.

BY EMERSON HOOPES, MUSCATINE.

Sweet potato culture is one of the branches of business which seems to be inexhaustible as how to obtain the best results.

I might dwell upon the different ways to care for them, but in order to make this paper brief, I will tell in my opinion the most economical way of raising a good crop. We will first begin at the hot bed, of course you all understand how to prepare the hot-bed itself, but after the potatoes are laid is when precaution shonld be used. If the weather is cold I prefer covering

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them with very coarse manure. On the other hand if warm, nothing is needed except the usual board covering. When the potatoes are sprouting, the beds require several rakings to keep the dirt loose and this also holds the heat. When the plants are being pulled is where a great deal of care should be exercised. Many times the beds will get too hot in spots and the potato will sprout quickly and then rot enough to cause the plant to either decay a little on the end of the root or form a dark center in the stem root. When your plants are that way, better not use them for they will eventually die.

Now having good healthy plants to start with prepare for the field. Select, if possible, land suitable for both sweet potatoes and melons, so that the crop may be alternated each year. Considerable trouble has been experienced by cropping the land too long with sweet potatoes, the soil finally becomes exhausted, the sweet potatoes of an inferior quality, affected with the scab, and lastly the yield per acre is very small. I prefer preparing the ground in the fall by plowing, then in the spring by using the disk once or twice the soil is nicely pulverized.

Mark out with a single shovel making the rows about 3 feet 8 inches apart, then manure in the row, five to ten loads of fertilizer to an acre according to the fertility of the soil, like any other business the best results are obtained by experience. Throw a medium ridge with a lister being careful that the fertilizer is all covered. Now we are ready to set the plants, usually beginnining about May 10th. Planting is done with a machine, placing them twenty-three inches apart in the row. Use plenty of water. One of the best ways to cultivate the sweet potato is with the ordinary cultivator. Work should commence as soon as the plant gets started and before the weeds make their appearance, thus keeping in advance of the little pests the season through. When the plants begin to vine put on side rakes, which will draw them to the center of the row. Sweet potatoes generally need from four to five plowings with two or three hoeings. As soon as the vines get so large as to cover the ground, in my opinion, one should cease working them, for if the soil is continually kept loose a great many joints will sprout a clump of potatoes, which of course takes a great deal of vitality from the main hill. As the season progresses go through the patch occasionally and clip out the weeds, keeping your patches clean, so that in the fall when you go into reap your harvest, you will not have to battle with the tumble-weeds and sandbur, but can plow out 100 to 250 bushels per acre. A rich reward for your seasons labor. Changing of crop each year is quite essential to obtain the best results.

By experience we have found that a short, chunky potato is preferable in the market to a long one. Then when the housewife comes to prepare them for the table, a large, short potato has less waste, is of a finer grain and flavor and can be more easily quartered.

There are a great many varieties of potatoes raised on Muscatine Island, but the "Yellow Jersey" leads them all as a standard crop. There are also several ways of raising a crop—planting on the level, on low ridges and high ridges, all of which is a matter of theory as to the best results. It is not always the way a crop is planted that brings the largest yield, but the manner in which it is tended is a very important factor. The growing of the lucious sweet potato is fast becoming one of the leading industries in the United States. The satisfaction gained when the golden tubers are turned out of the ground, I think must be fully equal to the lonely miner's in the

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frozen fields of Nome as he digs out his yellow nuggets, and unlike the gold, they are a luxury of which the rich man and poor man can have a share. A successful sweet potato grower gains a great deal of his knowledge from practical experience. It is not simply the "Man with the Hoe", but the man who thinks well and puts his thoughts into action.

W. O. WILLARD: Is the difference between the long and short potato the result of cultivation?

EMERSON HOOPES: Well there are different varieties of yellow sweet potatoes. Some are naturally long, while other varieties are short and chunky. The seed commonly known as the Yellow Jersey is of the short, chunky nature, and then there are others which are inclined to be long. The way they are planted has a great deal to do with it. The heavier the soil, the longer and rougher potato you will have, and the finer your soil is, if sandy, the smoother your potato will be.

MEMBER: Does Yellow Nansemond stand second?

EMERSON HOOPES: The Yellow Nansemond stands first if you cannot get Yellow Jersey. Perhaps you might call it second.

MEMBER: Are red ones grown to any extent on the island?

EMERSON HOOPES: Not to any great extent. Most everybody raises Red Bermudas or red Jerseys for seed purposes.

MEMBER: What success do you have with the vineless sweet potato?

EMERSON HOOPES: I have never raised any. From what I have observed they are not a very practical potato for this locality. They are inclined to be rough and from what I have seen the yield is nothing to brag of.

C. W. BURTON: How many acres have you?

EMERSON HOOPES: I only had about ten acres this year. I am not one of the largest sweet potato growers.

C. W. BURTON: Every other year you plant watermelons on the same soil, which do you find most profitable?

EMERSON HOOPES: We have to work part of the time for nothing. There is not nearly so much work about the melon and it is fairly profitable. The sweet potato is a great deal of work and is also fairly profitable.

MEMBER: Is irrigation necessary in seasons like last?

EMERSON HOOPES: I do not think it was any advantage last year. The rains came at such times that I don't think we could have had a much better crop. Most of the profit from irrigation is with some crop like the cabbage. With the sweet potato too much water makes them tasteless.

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EVENING SESSION—THIRD DAY.

CARE IN PROPAGATION.

BY DANIEL SHANK, CLAYTON, ILL.

Mr. President, Ladies and Gentlemen:

I recognize in you, fellow craftsmen, as your very presence here bespeaks your interest in this noble calling. And I assure you that it is with no small degree of appreciation that I accept your courteous invitation to address you this day, and to confer with you in your deliberations upon the subject, which no doubt, brings the human nearer in touch with the divine than any other occupation known to man. We remember how it is said in Holy Writ: God made a garden and placed man in the midst of it, commanding that he should eat the fruit thereof, with one exception, hence this should prove to us that this was God's highest ideal of man's occupation, viz: that of a fruit grower.

We as fruit growers are assembled from two of the most closely allied sister states bordering on the "Father of Waters," and we should all be proud to be called sons or daughters of this glorious nation, whether by birth or adoption. I come to you, brother fruit growers, as a representative of our associated sister society, the Mississippi Valley Apple Growers' Association, of which your beloved Lee county is an integral part. We, perhaps as you know, cover eight counties in Illinois, five in Missouri, and one, Lee county, in Iowa, and we bid all those who join us a hearty welcome, should they desire to associate with us. Our headquarters is at Quincy, the Gem City of Illinois. Our organization is now twenty months old, and the work now done is of inestimable value to hundreds of our leading apple growers. Our association, as its name indicates, is confined wholly to apple growing, while your society extends to all classes of horticulture.

I am glad to say to you that I am a life member of the Illinois State Horticultural Society, and have been identified with its work ever since 1885, and I assure you we esteem very highly, the hearty co-operation now existing between your state society and that of Illinois. We would bid you a hearty welcome to our annual meeting, to be held in Champaign, on December 11, 12 and 13.

We have come together, dear friends, to compare notes of our successes or failures for this, perhaps the most eccentric season for many decades. We had such a magnificent promise for an abundant fruit crop in the early spring; but alas, "it is not all gold that glitters," and well has the poet said, "and shall we soar to worlds on high on flowery beds of ease." For as the season advanced, we were brought face to face with almost every conceivable enemy known to horticulturists. But we live to-day to recount

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the many experiences we have passed through during the year. Time would forbid, and it would diverge from the subject to attempt to mention even a part of our troubles.

To your humble servant has been assigned the very important subject of "Care in Propagation," a topic fraught with many more important points than can be crowded into the limit of time that can be allowed to it. Hence, this paper shall be confined to the suggestive, more than to the demonstrative. That I may be clearly understood, my remarks shall be confined wholly to the care of propagating the apple; yet the facts laid down here will apply to all classes of fruit.

Care in propagation must begin in the selection of seed, from which we grow the seedlings, for this is the foundation upon which we now build, and if the foundation should be weak, the tree is sure to be weak; and if the foundation is strong and healthy, we have a good start for a healthy tree. It is an old maxim "like begets like." This is true in a sense, but in many things it is not true. We must remember that nature has an unwritten law, from whose decrees there is no appeal. This law is hard to understand, and the best of us can scarcely guess at a verdict it will render. By this, I refer to the power of cross fertilization. Who can tell what effect will be produced by cross pollenization, even of any two varieties of any of our common apples? It may tend to degenerate the offspring or if may tend to invigorate it. But as a rule the tendency is backward, rather than forward, which fact is fully demonstrated in that it is very rare we get a better apple or a stronger tree from the seed than was the original. I cannot conceive of any better illustration to bring out this point, than we have in the twenty-six letters of the alphabet. We take the first two letters and we can spell but two words—ab and ba. So with the Winesap and Grimes Golden; we can make one direct cross and any number of blendings, which is not true of the first two letters. Now let us add two more letters to the first two and you see there is a possibility of making a vast number of words; and the same possibilities exist with any four varieties of apples. Now with the twenty-six letters of the alphabet, we have so changed and blended them as to bring out all the words known to the English language. And with our many varied orchards, we have the possibilities to produce an equal, if not greater number of new varieties than there are words in the English language. Hence the uncertainty of seeds gathered from our cider mills, where as a rule only the refuse apples are taken. These will bring a very uneven class of seedlings; some of a strong, vigorous growth, and some very feeble; some upright, some dwarfish; some all for taproot, some all to lateral. Now if we use this class of stock, we must expect that each scion or bud inserted into such roots will be so influenced as to make a marked difference on the tree. It has been very justly conceded that the root has a strong influence over the scion. But to reach any degree of certainty we must use seeds that run uniform in their habit of growth.

There is no question about this assertion, and to the fact that many nurserymen are using the low grade seed, can be traced the cause for many orchards dying off prematurely. This is a day when price is the paramount issue, and the average buyer is governed wholly by the price, forgetting that while he is "saving at a spiggot he is losing at the bung."

We now come to another phase of the nurseryman's need of "Care in

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Propagation." It is in the selection of scions and buds. Many nurserymen do not seem to know that by cutting wood from the young trees in the nursery rows they will retard the trees so produced, in their bearing. If the farmer would go into his field and select his seed corn from the immature and unripe ears, what would be the result? In a few years his corn would not ripen, as the seasons would not be long enough. On the other hand, if he selected the earliest ears, soon his corn would be much earlier than before. Now this rule will hold good in the apple as well as in the corn. Your writer has been demonstrating these points for thirty years, as he began commercial apple growing in 1869, and he was thoroughly convinced that the apple would yield to intelligent treatment as much as any other farm product. So, beginning to act on this theory, he went through his orchards and selected trees showing the best quality of fruit, and from them cut scions and started a new orchard. From the time it began to bear it was evident a good step had been taken, and he was encouraged to try it a second time, by going through this first selected orchard and selecting from it the trees showing the best class of fruit, and from this selection we now have a ten year old orchard which is a matter of comment among our neighbors, as we had a fine crop of apples this year, when our neighbors have none, and for that matter no others had any apples to speak of, and what few they had were very faulty, and all were blown off by the Texas wind storm, thus proving beyond a doubt that we have bred into our trees vigor, productiveness and tenacity to hold their fruit until ripe.

So fully are we convinced of the points herein named we have retained a large block of these third generation trees, which are now at bearing age, and from this block we cut all our grafting wood, and it has brought us an unprecedented trade for trees. Yet we are not satisfied to stop here. We expect to so improve many of the old standard varieties and bring them back to their natural state, if not to surpass it. The day has fully come when quality and not quantity is to govern in profit or loss of apple growing. There is no danger of ever glutting the market with fancy apples. So I am lead to believe that when we give apple growing as much intelligent care as we do corn, or stock growing, we shall be as correspondingly successful.

Then again, care in propagation rests very heavily on the shoulders of the nurseryman, as to what varieties he propagates and sells to the public. It is his business to test all varieties and prove their value before recommending them to the public. It is one thing to grow trees and sell them, but it is quite another thing to grow an orchard, and thoroughly test the different varieties before offering them to the planter.

Then again, care in propagation is needed to get the young trees properly shaped, for as a rule the novice has but a vague idea of forming the tree, and in most cases it is left to its own sweet will, to grow as you please, or grow if you can, perhaps is the better way to express it. I am of the opinion that the leading stem should never be removed from the tree, for in so doing, you at once throw the top into crotches and forks, and sooner or later they will begin to break out, either from wind, sleet or overbearing, and the break is always from the heart of the tree. When, if the center branch is maintained, each branch growing out from it forms a graceful bough, which will not break out of the trunk of the tree. Hence, I take the stand that any tree that has been cut back to form a head is not worthy a place in the orchard.

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ADVANTAGES OF UNION IN EFFORTS.

BY JAMES HANDLEY, QUINCY, ILL.

There are two small words in the English language, widely divergent in meaning, carrying a compressed force of power suggestive of rifle balls speeding at a mark, particularly when they are aimed at the target of truth. They are the monosylables "root" and "fruit." In the investigation of any subject it is imperatively necessary to commence by striking deep down to the very root of the matter, otherwise we will resemble the persons who "conceive in chaff and bring forth stubble."

In the various and diversified opportunities open for those who would not be cumberers of the ground in the fields of life, distinction has waited on and given the most deserving laurels to those who began right and continued to thoroughly comprehend the course which started with one good, strong link, leading the way to safe and sure connections with other links of equal strength, until a grand union of efforts was forged in a powerful chain, each link carrying its own weight, and all showing a combination capable of standing the utmost strain in a long and steady pull, for the most desirable points of achievement.

In striving for an education needed as an equipment in any of the arenas of conflict there is a compulsion to commence with primary principles; first the seed, then the root; later the blossom and in after years the fruit. Nature's laws are inexorable. All of us are confronted with the divine truth, "whatsoever a man soweth, that also shall he reap." Hence, in order to gather the best fruits, there must be definite aims at the object in view, and forces all along the line must move in perfect consonance, each with the other, blending in harmony for the fitting finale that scores a time of triumph.

We find great opportunities for study in the book of nature. Its broad pages, brightened with beautiful illustrations, are always wide open, inviting careful, sober inquiry and promising the richest rewards for patient investigation. The refreshment to intellectual faculties is not confined wholly to watching the growth of plants and trees, and to the observation of various causes which lead to golden harvests; all of which are pleasing to contemplate, especially when we realize the elevating influences which lift the mind through the many of nature's changing scenes up to nature's God. There is also much to be learned which will excite wonder and curiosity in studying the habits of multitudes of insects, and other pests which are the avowed enemies of the fruit-grower, and which must be exterminated in the most efficient manner. From seed time to harvest, through blight and bloom, sun and shower, cold and heat, light and darkness, comparing even every extreme with its opposite, we can clearly discern a concourse of measures clearly consistent in contributing to the power of production and reproduction in all the phases of organic life.

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In looking then at nature we cannot fail to see that "Order is Heaven's first law," and that there is the most perfect union in all of its spheres. From the time the morning stars sang together there has been an unbroken harmony which will continue to be governed by immutable laws until the last notes of departing time shall have been sounded. In working out our salvation we would do well to take heed and learn the lessons of being in perfect accord with everything that will serve us to the best advantage. We do well to form unions with those whose vocations are similar to ours in order to get the best results of the ripest experience and to profit by expressions and discussions which may be found at regular meetings.

I fully appreciate the courtesy of an invitation from your secretary to take part in this meeting, especially so as I come as a representative of the Mississippi Valley Apple Growers' Association which sends its cordial greetings. Our society was organized a year ago last spring. It started with six members and now has an enrollment of more than one hundred. Its membership includes a good representation of the apple growers in the Mississippi valley and it has honorary members living as far east as New York and as far west as Old Mexico. In the short time of its existence it has been asserted that Adams county, Illinois, has been directly benefited to an extent of from $5,000 to $10,000 and many of the adjoining counties have felt the good effects of its salutary influences.

It is a great privilege for fruit growers to come together in a meeting of the present character. The advantages should be more highly appreciated than is often apparent. Such meetings stand like guide boards to safely direct the traveler over roads which he has not previously traveled; and when the pathways seem dark and intricate there are always those in attendance who are ready to aid by turning on search lights and making the way clear to those who are seeking the right course. The benefit is mutual to those who teach and to those who are instructed as it has been truly said that no man is sure that he knows a proposition until he is capable of demonstrating it clearly to others. Hence, the earnest seeker can go away from these gatherings with information that will be of inestimable value in building stepping stones on which he may rise to the heights of honorable success. And then we should not overlook or underestimate the value which comes with closer acquaintance, the engendering of social feelings and in receiving true sympathy which is cheering and helpful in all fields of labor.

The bonds of union should extend beyond the producer and include the shipper and buyer, manufacturer and consumer. The fruit grower should understand the markets, and, as far as it is in his power, be able to furnish what they most demand. There is no reason why he should not work in harmony with the purchaser, and if it should be found necessary to erect evaporators and canning factories to utilize surplus crops, all who wish to start such industries should be heartily encouraged. There should be no clashing or class against class in such commendable enterprises. All should work together. There are times when wise and judicious state and national legislation is of the greatest aid to farmers and fruit growers, and such help may readily be obtained when all work in perfect unison.

Our societies can make their force felt in legislative halls. When the people speak their public servants must obey. Iowa has made itself famous as a great producing state, and it has been widely noted for its immense crops

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of corn. In the past, stories have been commonly circulated telling us that the corn crop of this state was so great and abundant as to cause it to have but little value, and we have read that in such instances the people have used corn for fuel, considering it cheaper than coal. Such conditions are seemingly to be regretted. It looks too much like a waste and sin to burn nourishing food in one part of the country, when there are thousands in another part famishing for want of necessary sustenance.

We have all gladly noted the grand revolutions along this line in the past few years. It was discovered that the United States raised about 92 per cent of the annual corn crop and the remaining small percentage was grown by the rest of the world. Hence, it was necessary to work for a larger exportation of this cereal. The movement was encouraged and led by Hon. James Wilson, United States Secretary of Agriculture. The American Corn Propaganda was organized. The Illinois Bankers' Association at the instance of one of its members, E. J. Parker, of Quincy, Ill., took a prominent hand in the movement and measures were promptly instituted of sufficient proportion by Congress to maintain a Corn Kitchen at the Paris Exposition. I take pleasure and pardonable pride in saying that the Quincy Chamber of Commerce, of which I am secretary, was the first commercial organization to urge the United States Senate and House of Representatives to make the appropriation as large as possible, and we also wrote to all kindred organizations in the country, requesting them to work with a union in efforts for the object in view. In behalf of the organization I sent circular letters as far east as Maine, as far west as California, and from Minneapolis to New Orleans, asking that a general pressure be brought upon the state and national legislatures in supporting this movement. Responsive chords of sympathy were reached, and while the highest appropriations desired were not gained, still there were some grand results, which will become more and more apparent as the years roll by.

The Corn Kitchen was made a signal success at the Paris Exposition and the introduction of corn as a food has been widely spread through the Eastern Hemisphere, and we shall surely see the growing demand for corn for foreign exports will prevent former unprofitable prices for production. An increasing business will be given to all railroad traffic and there will be a constant tendency to swell the freight receipts on ocean going steamers. In short, we shall see corn again enthroned as King instead of seeing its wasted ashes at the common fire places.

I have alluded to the beneficient change brought about in this direction to demonstrate the irresistable power that may be acquired when the people join hands in a long pull, a steady pull, and a pull altogether.

When favored by Providence with abundant crops of small fruits, we have been obliged to notice that prices were cheap, in fact so little at times has been offered for berries that it did not pay to pick them. In such cases there is a crying demand for canning factories, or for some means of preserving the fruit for shipment. It does not seem to be quite right that rich and luscious fruit should be rotting in abundance in some parts of the land while in other portions there are people who hardly know the taste of fruit from one end of the year to the other. It is then that a strong union of effort is required to overcome these conditions.

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The fruit growers of Southeastern Iowa are to be heartily congratulated on the existence of their honored society and for its long career of usefulness in this region of the country. There can be no way of estimating the great good it has accomplished in the past thirty years. We are glad to know that it has been permanently planted in a fertile soil, and it is to be hoped that through many decades of the coming years its roots will continue to spread wider, and strike deeper in establishing the firmest hold in the minds of appreciative people; that each returning season will bring the good cheer of its buds and blossoms, redolent with an aroma giving an assurance of the fruition of earnest hopes and that the pleasant associations formed at the meetings may long linger in the recesses of most fragrant memories.

As its sphere of work is located in the Mississippi Valley, its efforts radiate from the very heart of our common country, and organizations from both sides of the river should be glad to avail themselves of the privileges of profiting by its teachings and of blending in a union for reaching higher degrees of perfection in a vast and open field of possibilities.

No doubt you have often observed many of the streams rising in the bluffs on either side of the Father of Waters. No one stream on the upper division attracts marked attention or distinction in itself, but when the flowing tides empty together into the grand river what an irresistable force of power is given to the mighty Mississippi! On the commingling waters are carried the logs and lumber from the Northern pineries; stately steamboats are floated and ample provisions are made for cheaply transporting the products of wide divisions in many flourishing states.

There are many horticultural societies on each side of the river, no doubt accomplishing good results, working along their own individual lines, but the highest benefits will never be reached until there is a greater blending of endeavors with the clear conception of the fact that what is best for the country at large is sure to promote the prosperity of each individual citizen.

With such convictions, some of us who live on the east side of the river, avail ourselves to-day of the opportunity of mingling with a goodly number living on the west side, seeking for closer acquaintance, hoping for mutual benefits which form an alliance stronger than hooks of steel and rivet fraternal ties in the most enduring bonds of good fellowship.

THE APPLE CUTTING.

BY A. J. BUFFINGTON, SALEM.

"Oct. 20, 1850—Dear Jack:
Come to the apple cutting tonight.
Yours, Mack.
I look at the note, faded and old
And sniff of its odor, nothing but mold.
Though Pegasus' feet limp when I'm on his back,
We'll dodge Father Time and take the back track.
With his wing on the wind, and his foot on the ground
We'll pass fifty milestones swifter than hound,

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And be at this party early tonight,
In suit of my best, with locks nothing white.
I'll send you some notes you may read if you choose,
Or mark them "rejected" as stalest of news.
The log kitchen is lighted with four tallow dips.
And a bright burning fore-stick well kindled with chips.
No pictures on wall, but shadows that move,
No carpet on floor, but light that is wove.
The shovel and tongs are stokers at ease,
Conk-shell blown at meal time now sings of the seas.
Teakettle hums its es'r sweet song,
Roast apples sputter the ashes among.
Smoke curls upward around trammel and crane,
With sparks shooting through it in a meteor train.
Festoons of stringed apples hanging above
Shows care of fond mother for them that she loves.
The rifle that glints in the light of the fire
Will provide and protect in the hands of the sire.
Like bees to their hives when honey they've found,
Come youth and fair maidens from country around.
When Jennie sees Robert, I note she's well pleased,
The overgrown schoolboy seems illy at ease.
The belle that the eyes of every one seek,
Wears an aster in her hair and a rose on her cheek.
Hoods are hung up, hats are all doffed;
Put under the ladder that leads to the loft.
Dull knive are whet sharp on jambstone much wore;
The apples brought in are sound to the core;
For they grew in the orchard on the slope of the hill,
Where birds always gather if no one will kill.
Here robin and thrush sang their sweet matin song
And with fruit harming insects, all the day long
Fed their young broods, their clamor to still,
And when fruit became ripe, they presented their bill.
Paring and pairing, the work is begun
With much of small talk and innocent fun.
A paring unbroken, thrown over the head
Forms the initial of one you will wed;
Named apple seeds, heated, moving apart,
No joining of hand, no union of heart;
Approaching each other, you plainly can see
Ere winter is passed, a wedding there'll be;
Apple seeds counted, fate the last numbers carry,
The highest prize drawn is, "Twelve, they marry."
Fortunes all told, and apples all done,
Badinage and wit still have a free run
In thrust and in parry and in quick repartee
That seasons the talk wherever it be.
A repast is soon served from pantry well stored,
The best of sweet cider is drank from a gourd,

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When drawn from the barrel the bunghole said "good."
None did dispute, nobody could.
In couples we march to a song in the play,
And many mock weddings are the end of the lay.
Each beau escorts her whom his fancy does single;
If Pegasus carry double, to make my verse jingle,
I'll take mine behind me, it isn't yet late,
And step in if she asks me, or swing on the gate.
Pegasus broke loose—is clear out of sight.
I'll have to walk home; I bid you good night.

TREASURER'S REPORT FOR 1900.

BY FRANK O. HARRINGTON, WILLIAMSBURG.

RECEIPTS.

January 12, Cash from predecessor in office	$148.18	
Interest 10 months at 4 per cent	4.93	
November 22, twenty-two annual memberships	22.00	
November 22, five memberships during the year	5.00	
November 22, one life membership	5.00	
November 25, appropriation from state society	150.00	
Total		$335.11

EXPENDITURES.

November 22, premiums on fruit	$ 21.25	
November 22, secretary's salary, including stenographer	75.00	
Expenses of secretary's office	11.50	
Expenses of janitor	2.00	
Expenses of officers and visitors	74.08	
Total		$183.83
To balance on hand, December 10, 1900		$151.28

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PROCEEDINGS

: : : OF THE : : :

NORTHEASTERN IOWA HORTICULTURAL SOCIETY

: : : HELD AT : : :

IOWA FALLS, IOWA, NOVEMBER 27, 28 AND 29, 1900.

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NORTHEASTERN IOWA HORTICULTURAL SOCIETY.

LIST OF OFFICERS FOR 1901.

PRESIDENT.

ELMER REEVES ..... Waverly

VICE-PRESIDENT.

J. B. MITCHELL ..... Cresco

SECRETARY.

C. H. TRUE..... Edgewood

TREASURER.

G. A. IVINS ..... Iowa Falls

BOARD OF DIRECTORS.

First District—F. G. BARNARD ..... Waukon
Second District—W. A. BURNAP ..... Clear Lake
Third District—B. F. FERRIS..... Hampton
Fourth District—W. H. GUILFORD ..... Dubuque

The next annual meeting will be held at Rockford, Floyd county, Iowa, December 17, 18 and 19, 1901.

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LIST OF MEMBERS NORTHEASTERN SOCIETY.

LIFE MEMBERS.

Brown, Eugene ..... Mason City
Burnap, W. A ..... Clear Lake
Ferris, S. W ..... Hampton
Mott, D. W ..... Hampton
Patten, C. G ..... Charles City
Parker, A. T ..... Mason City
Parker, H. G ..... Mason City
Reeves, Elmer ..... Waverly
Secor, Eugene ..... Forest City
Sherman, E. M ..... Charles City

HONORARY LIFE MEMBERS.

Gaylord, Edson ..... Nora Springs
Kenyon, O. A ..... McGregor

HONORARY MEMBERS FOR 1901.

J. L. Herbst ..... Sparta, Wis.
L. A. Clemons ..... Storm Lake
Wesley Greene ..... Davenport
Eugene F. Peck ..... Austin, Minn.
O. W. Moore ..... Spring Valley, Minn.

ANNUAL MEMBERSHIP FOR 1901.

Barnard, F. G ..... Waukon
Barhite, G. A ..... Alden
Calkins, E. R ..... Iowa Falls
Dumbolton, L. B ..... Rockford
Ferris, B. F ..... Hampton
Ferris, J. C ..... Hampton
Greene, Wesley ..... Davenport
Gardner, C. F ..... Osage
Guilford, W. H ..... Dubuque
Ivins, G. A ..... Iowa Falls
Lomen, O. O ..... Decorah
McHughes, W. J ..... Fairbank
McChesney, T. I ..... Iowa Falls
Neilson, J. P ..... Latimer
Patten, C. G ..... Charles City
Pomeroy, R. N ..... Buffalo Center
Ryan, Joseph ..... Ackley

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Shindelar, Albert W.....Calmar
True, C. H.....Edgewood
Trigg, J. S.....Rockford
Thompson, Jasper.....Forest City
Tower F. R.....Iowa Falls

LIST OF PREMIUMS.

TO BE AWARDED AT ROCKORD AT THE ANNUAL MEETING, 1901.

Best collection of apples grown by exhibitor	$6.00
Second best collection of apples grown by exhibitor	4.00
Best collection seedlings grown by exhibitor	2.00
Second best collection seedlings grown by exhibitor	1.00
Best seedling not exhibited prior to 1896	4.00
Second best seedling not exhibited prior to 1896	2,00
Best collection of apples recommended for northeast district	3.00
Second best collection of apples recommended for northeast district	2.00
For every variety, same as above, each plate	1.00
Best ten plates other varieties worthy cultivation, each	.50
Best displayed canned fruits and jellies	3.00
Best display evaporated apples	3.00
Best collection house plants	2.00
Best specimen plant in bloom	1.00
Best new plum, origin and history to accompany exhibit	2.00

All apples competing for premiums must be grown in the northeastern district, and all new seedlings must be accompanied by origin, history, and nature of soil and climate in which grown.

Four apples shall constitute a plate, and each variety must be correctly named.

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PROCEEDINGS

OF THE

Sixteenth Annual Meeting

OF THE

Northeastern Iowa Horticultural Society,

HELD AT IOWA FALLS, NOVEMBER 27, 28 AND 29, 1900.

TUESDAY AFTERNOON.

The annual meeting opened at 1 o'clock P. M., Pres. C. F. Gardner in the chair. Invocation was offered by Rev. G. B. Shoemaker, of the M. E. church of Iowa Falls, following which the regular program was taken up.

SUMMARY OF DIRECTOR'S REPORT.

Strawberries were, generally, a light crop in northeastern Iowa. The drought in the fall of 1899 caused a poor growth, and plants were scarce in many patches.

Raspberries were not over a half crop. Many of the canes were badly injured last winter. Blackberries were a poor crop except where the plants were covered, or were in protected locations. The prices for small fruit were quite satisfactory.

Grapes were a small crop from the scarcity of old vines, and new plantations have not yet come into bearing.

Cherries in about the same condition as grapes. The trees that were in good health produced a good crop, but many trees are in poor condition or dead. Plums a ltttle under an average

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yield. Apples a good crop, but ripened early and did not keep well.

F. G. BARNARD: Apples promised a big erop early in the season, but the fall and winter varieties dropped from the trees very badly and had to be picked before the usual time, and are not keeping well. I think they were ripened too soon by the very warm weather we had in the fall. The earliest apples brought a good price but there was not much demand for those that came in the season of the Duchess. Later kinds were in good demand at fair prices. The fruit was of good size, fairly perfect and remarkably free from worms.

I think we made a mistake in dropping some of the old kinds after the winter of 1884–5 and taking up the Russian and other early varieties; and most of them are too early to be profitable unless kept in cold storage. The average planter wants an apple that keeps with ordinary care.

W. A. BURNAP: We meet today in the closing hours of a most beautiful horticultural harvest, and our hearts and voices should be rightly attuned to the grateful sentiments we should express at our near coming Thanksgiving day.

The orchards of my vicinity presented a most magnificent sight, the trees were loaded to the utmost capacity of their ability to carry. Although we have had an unusually warm and late fall, and although many varieties of all kinds of trees, vines and shrubs yet carry almost their whole summer foliage, still the opinion of every member of this society, that I have consulted, is that trees are in more than fairly good condition for their winter rest, and that under any ordinary circumstances will likely come out next spring safely.

(Cions of past seasons growth of Repka Malenka, Hibernal, Patten's Greening, and Northwestern Greening had been sent to the director of the second district, by Clarence Wedge, of Austin, Minn., for inspection by the members of the society, and which upon close inspection were pronounced not injured by the autumn freezing. Mr. Burnap, also produced cions of Wealthy and Northwestern Greenings from both young and bearing trees upon his own premises. After an examination of the same, it was the unanimons verdict of the members that all were in favorable condition for the coming winter—SECRETARY.)

ELMER REEVES: The opinion has been quite prevalent that apple trees on account of the late rains and the unusally warm fall weather, are in an unripe and tender condition, but my

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opinion is, that they are in a safe condition. The fact that the leaves remain on the trees later than usual is not an indication that the contrary is true, since the withered and dead leaves have no further connection with the life of the tree. I think there is less cause for alarm than is indicated by the views of Mr. Harris and Mr. Wedge of Minnesota.

EUGENE SECOR: I was at Austin last week, and I would pronounce the trees which I examined there, in fairly good condition.

WESLEY GREENE: I think some varieties of apple trees may not be perfectly matured, but yet, in fair condition to go through the winter without injury, if it should not be too severe.

W. H. GUILFORD: The swelling of fruit buds indicating immaturity will no doubt disapper when cold weather sets in.

G. A. IVINS: I think the season has been most favorable to the developement of fruit buds.

L. B. DUMBOLTON: I am of the same opinion.

J. B. MITCHELL: Trees are holding their leaves later than usual it is true, but the wood is fairly well ripened. Rains coming on so early and continuing so long tends to toughen the leaves, causing them to adhere more closely to the trees.

J. S. TRIGG: Trees in my orchard have shed their leaves well this fall. I shall not believe that Hibernal, at least, can in any way be injured.

B. F. FERRIS: The apple yielded the best and most abundant crop we ever had. They brought from twenty-five to thirty cents per bushel about Hampton. Perhaps 25 per cent of the crop was allowed to waste because the farmers held for better prices, and for lack of time to attend to them. Another 25 per cent was hauled to the small towns and sold to grocers from the farmer's wagons. Another one-fourth was consumed by the growers, and train loads were shipped by rail to other states, from Hampton and near by. Shipments were made to North and South Dakota, Minnesota, Wisconsin, Illinois, Ohio and Indiana. It was said some of our surplus could find a market in southwestern Iowa, but as they used to grow their own apples, this was not generally known.

The promiscuous killing of fruit trees two years ago, affected the apple crop very much. The statement that all the varieties of the apple trees suffered alike is, I think, false. Oldenburg, Hibernal, Wealthy, Whitney, and in fact most of the summer and fall apple trees produced full crops, while many of the latter kinds had suffered seriously.

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The apple-scab is the worst of our troubles at present. Some orchards suffer much from it while others suffer but little. Apples like Walbridge, Rawle's Janet and Lawver that are known to be good keepers, have failed entirely when attacted by it. Spraying with the proper mixture will undoubtedly affect a cure if properly applied. A formula of the proper compound can no doubt be procured at any time by writing to our very worthy secretary, or to Wesley Greene, Des Moines, Iowa, or any other thorough horticulturist.

While there was surplus of many kinds of apples, the Oldenburg and Wealthy predominated. I think at least nine tenths of the entire crop was of these two varieties. Plumb's Cider, Whitney, Tetofski, Haas, Hibernal, Kaump, Wolf River, St. Lawerence, Longfield, for early, with Walbridge, Iowa Blush, Allen's Choice, Tolman Sweet and a few others for late, made the genersl list: The Walbridge produced more than all the other late kinds. The N. W. Greening and Salome are becoming favorably known. Charlamoff is worthy of special mention; as large as the Oldenburg and better, with very little difference in the tree. Patten's Greening also is coming to the front in good shape. The experimental station at Hampton gave opportunity for plenty of study. With at least two trees where there should be but one of every known kind and a few unknown, all heavy loaded with fruit was an object lesson indeed.

W. H. GUILFORD: I want to mention the value of some of the work done in an experimental way. In the former station aided for years by society funds, of apples suitable for our bluff soil I can speak favorably of Yellow Transparent, Longfield, Antonovka, Repka, Aport, Borovinka, Hibernal, and a few other Russian varieties not properly identified. Early Colton is growing in favor. Of domestic plums I can speak favorably of Mirabelle, Yellow Moldaoka and a seedling of Early Red. Gakovska pear twelve years in orchard is giving satisfaction, bears heavily, perfectly hardy, no blight, quality best. Bessemanka No. 418, 413 and a few others are almost identical. If left to ripen on the tree they rot at the core, but if picked hard and ripened in a cool shade they are very good. All our pears are on their own roots. The poorest of our Russian pears, when properly ripened, is much better then Kieffer.

In cherries, Early Morello, Sparte Morello, Boquet Morello and Lutovka are good, the latter does not come into bearing early. Valdmier is almost identical with Early Richmond,

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Double Natte is good. We have seedlings of the Russian cherriesthat gives evidence of great value. The Amur Barbery is the best hedge plant I have seen growing; low and stocky, very thorny, beautiful in bloom, and seeds abundantly. It will protect the orchards and fruit gardens, it will stop dogs, rabbits and boys For fine shade the following valuable trees should be better known, Prunus Maacki, Laurel Willow and Schwedlers' Scarlet Maple, also Acer Grannala or White Tartary Maple, this is a true flowering maple. The Loudon Red Willow is but little known. In our grove of fifty trees the growth in ten years from cuttings is fourteen inches in circumference. In twenty years they will make a two foot saw log of valuable lumber. During March the twigs are as as bright as scarlet dogwood. Dubuque parties contemplate planting it largely on the Mississippi islands.

Last winter was but little improvement on the preceding disasterous freeze, in fact the past winter was the most ruinous to the small fruit growers. Raspberries of the grade in hardiness of the old Philadelphia froze out. Older and Conrath stood best with me, Turner, Loudon, etc. went out bad; not by root killing, but froze from the top down.

Orchards in blue grass or other cover crops during the past two winters had some apples, but premature dropping, scab, worms and misshapen fruit, gave evidence of tree injuries. It seems that trees, like animals, in a healthy condition can throw off their parisites, but when sick and feeble the parisites predominate to hasten decay and death In the Dubuque market Wealthy was variable in size and keeping qualities, about as the trees passed through the ordeal of root killing during the past two winters. Antonovka is being recognized on our market as a good cooking apple. Plumb's Cider succeeds well on our bluff soils. We usually have enough summer and fall apples of our own growing, the probabilities now are that we must depend on the east and south until the old orchards are rebuilt on a safer foundation.

In common with other orchard fruits, plums suffered badly, even the groves of wild plums where pastured close were frozen out, mulch or not, everything on Myrobolan went out. Marianna came through very well where protected. Native seedlings were not safe. Our orchard protected by two inches of coarse manure came through safely and had a fair crop. There was poor sale for early plums. The Japans came in from east and south, their low

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quality had the market nauseated when our good native and wild sorts were offered.

CHERRIES. In some particular places I noticed that the bearing trees were on sunny, south slopes on rather thin soil. Good choice Morellos and some other dark cherries sold up or above California cherries.

Grapes are practically wiped out. The replanting of spring '99 was about all dead again last spring. There will be some planting but the large growers are going out of the business. Everybody seems to depend on cheap eastern grapes, but better plant again there will be trouble ahead for eastern growers.

Wood is the popular strawberry. It stands at the head for yield, but not quite red enough for fancy market, as a home berry it leads all others. During the ripening season we visited probably fifty plantations and noted the behavior of such varieties as Clyde, Bismark, Marshall, Nick Ohmer, Brandywine, etc. There are some objectional features about all. Many are holding to the old Crescent. From what I can see and learn I believe Enhance is the coming berry.

Blackberries in patches in grass and sod strangled up a few sore rooted canes that got another nip last winter. In the midst of the general disaster I found one plantation in perfect condition this probably owing to environments, soil, conditions, or something beyond our comprehension. This acre realized the owner nearly five hundred dollars. Mr. Densler thinks he has a new variety but unfortunately it is the plain good old Snyder.

ELMER REEVES: Since mention of the Loudon Willow has been made in the report, I wish to say that it is the finest willow that I have yet seen.

I would like to ask Mr. Guilford what the effect would be if the grass that is around his pear trees, which he has pronounced free from blight, should be removed and the ground be thoroughly cultivated?

W. H. GUILFORD: They would, no doubt, have died.

W. A. BURNAP: I will ask Mr. Gardner and Mr. Guilford if either had any root-killing in the orchard or nursery the past winter?

Both members replied "No."

Eugene F. Peck, delegate from the Minnesota State Horticultural Society being present, was introduced by President Gardner, and asked to offer some remarks.

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EUGENE F. PECK: I feel that I am in a place where I do not properly belong, but I shall try to be at home among you. I come to you as a member of the Minnesota Society, but I do not feel capable of representing but a small part of that society. I like the way in which this meeting starts out and hope to be able to absorb much useful information that will prove helpful to others on my return to my own state.

At one time I was engaged in the small fruit business in Wisconsin, and cultivated fourteen varieties of raspberries. I finally discarded all but Gregg and Miller. Both Miller and Loudon suffered badly last season from root-killing, while the Gregg along side of those varieties came through in good condition, but the fruit on account of continued dry, hot weather, fairly evaporated on the bushes. From four hundred hills of the Miller, I have picked from four to five cases, and sold them at the rate of twenty-five cents per quart. By cutting the canes back in the fall, from four to five inches from the ground, I get my first crop on branches from these stubs about July first, and another later crop from new canes of the same season's growth, and yielding from one-fourth to one-half larger crop than the first.

J. S. TRIGG: Have you observed any ill-effects the following season on account of such severe pruning?

E. F. PECK: None whatever.

W. H. GUILFORD: Have you any objections to Miller's Red?

E. F. PECK: Yes, my family do not care for them on the table, but they have a good appearance and sell well in the market.

O. W. Moore, delegate from the Southern Minnesota Horticultural Society, was introduced by the president and asked to make a brief report.

O. W. MOORE: Three years ago, a few of the southern counties in the state, united to form at Austin what is known as the Southern Minnesota Horticultural Society. My own home is at Spring Valley, Fillmore county. I have no detailed report to make regarding the fruit crop last season, but will say that the crop of apples was quite a full one. The Wealthy, especially, bore abundantly, but matured its fruit unusually early on account of the peculiar conditions of the season, and consequently did not keep well. Malinda, and some other sorts, also produced fair crops.

Strawberries set a very large crop of fruit, but on account of the scarcity of water there was not more than half of an ordinary yield. Raspberries were badly killed out. The variety standing

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the test best was the Loudon, and that without any covering. Plums produced about one-half a crop, bloomed profusely but did not fertilize well. The Compass cherry, with me, bore the second season after setting out. Nothing equals it in productiveness. It is supposed to be a cross between the plum and sand cherry.

J. S. TRIGG: Do you recommend it for family use?

O. W. MOORE: Yes I do. It is one-half larger than the Early Richmond cherry. Different parties have examined the tree and fruit and already some orders have made for cions or trees.

W. A. BURNAP: How extensively is the Malinda apple grown in your vicinity?

O. W. MOORE: There are several orchards of it, and at our meeting at Austin there were six entries made of that variety.

C. F. GARDNER: I have paid considerable attention to the Compass cherry, and I believe it to be a cross between the plum and cherry. Some years ago I planted some cherry pits that I had procured from Mr. M. E. Hinkley. The trees from these pits stood for more than three years. There was one that especially attracted my attention. It is now some six years old, and from the description of the Compass cherry, this one seems to resemble it exactly. In appearance the fruit seems about midway between the plum and cherry.

ELMER REEVES: We ought to emphasize the fact that this is not a perfect cherry but a probable cross between the cherry and the Miner plum.

O. W. MOORE: Let it be understood that I do not now recommend it as a desirable fruit for the market, but only as a novelty for family use.

W. H. GUILFORD: Will it rot on the tree?

O. W. MOORE: No sir.

At this point, O. W. Moore, E. F. Peck, Wesley Greene and L. A. Clemons were made honorary members by unanimous vote of the society.

TUESDAY EVENING.

The president announced the appointment of the following committees:

On awarding of premiums: Eugene Secor, O. W. Moore and Elmer Reeves.

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On resolutions: W. A. Burnap, J. S. Trigg and L. B. Dumbolton.

On reports of secretary and treasurer: W. H. Guilford, Jasper Thompson and B. F. Ferris. Society voted to omit the reading and discussion of papers furnished for the occasion, by absent members and writers, but that they should appear in the published report.

The address of welcome to the society on behalf of the citizens of Iowa Falls, was given by their Mayor, F. W. Williams, and was offered in a very cordial and pleasing manner, and highly appreciated by the members of the society and others who were present.

The response to the address was made by J. S. Trigg, of Rockford, in his usual original and pleasing manner, and seemed to fully satisfy the expectations of both acquaintances and strangers.

REPORT OF DELEGATE TO SOUTHERN MINNESOTA HORTICULTURAL SOCIETY.

BY ELMER REEVES, WAVERLY.

Ladies and Gentlemen:

Agreeable to the request of your president, I atttended the aforesaid society meeting and found its members in session in a large hall. While the attendance was not very large, at the same time it was a decidedly interesting and enthusiastic one throughout, President Hawkins presided. His annual address shows the interest taken in the horticultural matters in southern Minnesota to be in prime condition. They think up there, that the question of summer and fall apples is well settled, and they have hopes of satisfactory winter varieties. The general opinion among them is, that the Northwestern Greening is a safe apple to grow. It is regarded as a good apple both for market and home use, and a good keeper. Several seedlings of promise are coming into use. One of which resembles the Ben Davis, specimens of the same being on exhibition at their meeting. The tree is better and hardier than Ben Davis, a seedling promising to be of great value. The subject "What ails my Orchard" called out much discussion, various things were suggested by different ones as being the prime hindrance to successfnl orcharding, not the least of which was mentioned, the worm pests. Mr. Brand has produced many valuable apples. Among them is the Peerless and others. Mr. Brand spoke of the condition of apple trees in the state as being unfavorable and as unripe in wood development as in the year 1884 and 1885, when our orchards were so generally swept away. The subject "Is pleasing the eye in horticulture more profitable than pleasing the palate" called out some pointed remarks. One speaker said that the Ben Davis apple had made more money for the planter than

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many other sorts, and that the value of a fruit is what we look for. Others thought that if better apples, such as Jonathan and Grimes' Golden were grown more extensively, the demand for such fruit would increase, and that if the good quality was brought out in our market apples, the sale would take care of itself. It was the general opinion that thorough spraying must be resorted to in order to secure more perfect and saleable fruit. In the discussion following the subject "What ails my vineyard" Mr. Kimball said that the trouble with his was that that the vines were all dead. Yet he had covered them, but all sorts seemed to share the same fate. Someone suggested that had he covered the vines with some sort of mulch he might have saved them. The same varieties which they recommend growing are the same as are given in our list, viz., Moore's Early, Worden and Concord. Mr. Livingston, of Spring Valley, spoke of the injuries to the fruit industries resulting from the work of poor and irresponsible salesmen, while many other people agreed with his ideas.

The paper read by Mrs. Freeman, "How to keep the boys on the farm" was an excellent production and was appropriate to the times. In answer to my question, "Do you think we should try to keep the boys on the farm," she replied, we must give them a chance for a good education and then let them choose for themselves. The secretary of the Minnesota horticultural society is a lady, Mrs. Charles Brainard, and she is a competent officer and useful member. I had an opportunity to view the orchard of Mr. Kimball, of Austin. He has planted Virginia crab and Hibernal trees and topgrafted them with other sorts, and has had marked success along this line. He has Malinda, Longfield, N. W. Greening and Wealthy, thus topworked and all seemed to be doing well. Mr. Kimball favors topgrafting in the orchard rather than in the nursery. He prefers the Hibernal in some respects to the Virginia crab as a stock for topgrafting, and states that fruit from topgrafted trees is usually of larger and finer appearance.

WHAT MAY WE EXPECT OF THE NORTHWESTERN GREENING APPLE.

BY W. A. BURNAP, CLEAR LAKE.

This topic was not of my own selection, and it is well in view of anything that I can advance upon the subject that our secretary in stating it, placed an interrogation point at its end. This is a question that I, myself, have been asking for years, and in justice to myself and this society, I can do little more than note here, the information I have gathered and open the subject for your discussion.

As we can only ground our expectation for the future of the Northwestern Greening, upon what it has done in the past, I will go back to the year 1892. In that year the tree agents with big picture books and nimble tongues, commenced selling trees of this variety at fabulous prices, to the farmers of Cerro Gordo county, and because of this at the winter meeting of this society at Humboldt, I asked information as to its hardiness. Not one member recommended it. On the contrary without a dissenting voice or vote a resolution was past, "that this society does not recommend planting Northwestern

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Greening on its own roots." In support of that resolution C. L. Watrous said: It was reported as hardy as Ben Davis. Prof. Budd said, it was hurt where Talman Sweet was uninjured, and C. G. Patten said, that he set it in nursery row when it first came out and that it had injured every winter. That same year the courtesy of this society sent me as delegate to the Wisconsin meeting, and I there continued my inquiries concerning this apple. I there found that in its home in Waupaca county, Barnes and others, were planting it quite largely. But outside of this district, the horticulturlists of the state at large had little more confidence in it than our own members above quoted. All this settled the question of the Northwestern Greening in my mind adversely, and it would have forever so remained had it not been for one obtrusive fact that ultimately developed. Those trees of this variety set in 1892, disregarding the opinions and promulgations of this august body, and in defiance of the dictation of the Wisconsin state society, persisted in growing vigorously and now are bearing beautiful crops of fine apples. The behavior of these trees together with some facts later learned, induced me one year ago last spring to set five hundred trees of this variety in my own orchard and as yet, I am not sorry for the venture thus made.

As proof that others have also experienced a change of mind, and that for good or ill, this apple is rapidly gaining ground both in this state, Illinois and Wisconsin, I wish to quote from our own society reports.

From 1896 report: "Our state delegate to Illinois reports Northwestern Greening on recommended list for Northern Illinois. In Southwestern Iowa district in test vote, six had tried it and two recommended it."

From 1897 report, C. F. Gardner and J. C. Ferris both recommended it in experiment station reports. Of 17,514 trees sold by one nurseryman, 4,200 were Northwestern Greening.

R. P. Coe, delegate from Wisconsin, says it is largely planted in Wisconsin, and growing in favor as a decidedly good apple, a little hardier than Wealthy. That year five out of nineteen in our tabulated list chose it as one out of five best apples to set. G. A. Ivins chose it, one in three best. In southeast society, one man had tried it and recommended it.

In 1899, C. L. Watrous, delegate to Illinois, reports that with others, it has come to the front in that state. Wesley Greene says, it stood winter of 1898 and '99, with Duchess and Wealthy. W. H. Guilford, delegate to Wisconsin, reports Northwestern Greening held by many as best winter apple. C. G. Blodgett, in Southeastern Iowa, says all varieties attacked by twig blight except Northwestern Greening. In our tabulated list this year, ten out of twenty-three select this as one in best five apples. C. E. Gardner would set it in a commercial orchard.

A. J. Phillips, secretary of Wisconsin State Horticultural Society, named it first in a list of five best winter apples. He further said, more interest is being taken just now by fruit growers in Wisconsin, in growing Northwestern Greening than in any other subject.

Not long ago ten men were sent as committees to investigate and report on best and safest apples to plant in Wisconsin as a winter apple, and nine out of the ten reported in favor of the Northwestern Greening.

Now gentlemen of this society, you have pumped me absolutely dry on this subject. I do not know a single thing more about it, but if this paper

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will here and now provoke the careful and exhaustive discussion, the subject should receive, my object is accomplished and my pains will be amply repaid.

J. S. TRIGG: The objection to the Northwestern Greening in my locality is, that the fruit grows so large on young trees that it will not stay on until it fairly matures. I should like to know if this is the case with others?

W. A. BURNAP: I think not. It does not come into bearing quite so early as the Duchess and Wealthy. Two years ago I had serious injury in root-killing at my place, and the Northwestern Greening was affected least of all.

ELMER REEVES: Some years ago my neighbors would bring to market large green apples, saying they had the trees from agents and that they had bought other varieties with them, but that this particular sort came into bearing earlier than all others except Harry Kaump. That apple proves to be the Northwestern Greening.

W. H. GUILFORD: When I was up in Wisconsin, I witnessed a fine exhibit of this apple on their show tables. It is a colossal apple in Wisconsin, and I speak favorable of it because there they are very partial to it, although on my grounds it went out altogether in the year 1898 and '99. I think we shall not be able to judge of its true hardiness until we get a test winter like that of 1884 and '85. Top worked on some hardy crab; I think it will succeed admirably. Nearly all the trouble produced in our orchards in Iowa, results from root injury, and this may be overcome by top-working on suitable stocks.

J. S. TRIGG: Mr. Guilford seems to favor having our orchards on hardy stocks. Will he please name them?

W. H. GUILFORD: I mention Shield's crab, the Virginia and Transcendent crabs, Lake's Winter and Alaska, all are hardy and suitable stocks.

J. S. TRIGG: You would plant your varieties where you want your orchard and then in one year you would top-work them with the kind of apples you desire to make your permanent orchard, would you?

W. H. GUILFORD: Yes. In planting my orchard twenty-three years ago, I first put out Whitney crab trees; then afterward cut off the tops and grafted in Ben Davis, and those trees passed through two generations of trees on their own roots.

W. A. BURNAP: We have the subject of the Northwestern Greening as a special order, and now let us discuss it freely and know what there is in it or quit the business entirely. I have

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already stated how I regarded its behavior so far as I have observed.

J. B. MITCHELL: I propose a vote on this question. How many present consider the variety under consideration as hardy as the Duchess and Wealthy?

G. A. IVINS: I think I was the first to plant it in Hardin county. I set out about one hundred trees myself, and distributed it among my neighbors. It has seldom ever blighted. As has been stated, it does not bear as early as the Duchess and Wealthy when it comes to maturity. It forms very dense foliage, thus shading the crotches too much, which sometimes caused the rot to set in, but this fault may be corrected by properly thinning out the top.

J. B. MITCHELL: I believe no tree will stand so much freezing as the Hibernal. But with the Northwestern Greening we have not had it tested fully. It will appear all right on the outside when it is injured in the heart, and when it has gone through the test with the Duchess and Hibernal, we will have something by which to guage its hardiness.

B. F. FERRIS: My experience with this variety has been somewhat different from that of Mr. Burnap. If I could get it top-grafted on the Virginia crab, I would prefer it thus, but, if not, I would plant it on its own roots. My Northwestern Greenings killed worse two years ago, than did the Duchess and Wealthy. But there was a splendid reason for this. Those suffering most in the nursery row, occupied an unprotected corner where the snows were constantly blown off, and, no doubt, sustained greater injury on that account. It has stood well in my locality, except that one winter mentioned. It has been growing with us for ten years in the orchard and has been very fruitful, especially the past season. Where it has been top-worked on Virginia crab, Hibernal and Whitney, it is doing finely.

PRESIDENT GARDNER: How many have grown and fruited it? (Five members answer.) How many of you regard it as promising and would advise others to plant it? (Four members vote affirmatively.)

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THE WISCONSIN TRIAL ORCHARD.

BY J. L. HERBST, SPARTA, WIS.

Most of you are aware that the Wisconsin State Horticultural Society has a trial orchard located at Wausau, in the northern part of the state. Some of you are taking an interest in this orchard, reading the reports from time to time and watching what the results will be. Mr. Philips, my predecessor, worked hard and diligently to have a trial orchard established in the state, and was finally rewarded in having it done. In 1895 the legislature passed a law whereby they appropriated the sum of $250 for the maintenance of an experiment station. The location was decided on after having looked over several sites, and in the spring of 1897 the first trees were set out under the direction of Mr. Philips.

The orchard is located on the farm of Senator Krentzer, about three miles from the city. It is composed of ten acres, and lies fully exposed, with a gradual slope toward the north. The highway runs along the south of it, and when Mr. Philips was laying out the rows and setting the trees, many farmers passing by would remark, "What a piece of foolish work;" "Can't make apple trees grow up here." "It's all right as long as the state pays for it." To-day these same men are taking an interest in that orchard. To-day these same men are planting apples on their own farms. Sunday afternoon you will see these same men walking over their orchard, looking at the trees and wondering what the result will be. The orchard is divided into parts of five acres each. The north being the commercial orchard and the south half the experimental orchard. The trees are set in rows thirty feet apart, and trees twenty feet apart in the row. In the commercial orchard are planted such varieties as the Hibernal, Duchess, Northwestern Greening, Longfield, McMahon, Wealthy, Dudley's Winter, Peerless, Newell, Repka, Okabena, Wolf River, Hoardly, Alma, Patten's Greening, Avista, Dominion Winter and Malinda.

In Plums: Surprise, Wyant, Rollingstone, Forest Garden, Hawkeye, De Soto, Aitken, Weaver, Cheney, Stoddard, Marcus, Comfort, Pilot and Harris.

In Cherries: Early Richmond and Montmorency.

In the experimental orchard are planted about seventy-five different varieties of apples. Some of the varieties in this section are being experimented with in this way: First is set in a Wealthy tree three years old, then six to ten Wealthy root grafts, intending to leave the best one stand. Then is set a Virginia crab, to be topworked with Wealthy. Such varieties as Wealthy, Newell, Okebene, Windsor, Utter's Red, Northwestern Greening, Wolf River, Pearless, Patten's Greening, McMahon, Longfield, Eureka and Dudley's Winter are being used in this manner.

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Along the north and west side of the commercial orchard is set a row of Virginia crabs to be topworked. Already some of these have tops of Wealthy, Malinda, Seek-no-Further, Wolf River and Gano, and many grafts of the Northwestern Greening, Kaump, Longfield, McMahon, Peerless and Ripka were put in last spring, and each have made a remarkable growth notwithstanding they were put in late and scions were not of the best. We believe we have found in the Virginia the best stock for topworking. Mr. Philips has been grafting it for twenty years, and any one who will visit his farm will see how well it has adapted itself. We have as yet failed to find any variety that will outgrow it. A careful inspection of the orchard made last month by L. D. Kellogg and myself found it in the best condition. The trees have made a remarkable growth the past season, and grafts put in last season came nicely. Among the varieties that are showing up remarkably well are the Windsor, Dudley's Winter, Longfield, Northwestern Greening and Patten's Greening. The orchard at the present time has a cover crop of oats on most of it. We are experimenting with Sand Vetch as a cover crop. Have about an acre of it growing now.

J. S. TRIGG: What is the location of Wausau?

J. L. HERBST: About three degrees north of where we are now.

J. S. TRIGG: Do you usually have an abundance of snow there, and what is the nature of the soil there?

J. L. HERBST: Snows cover the ground generally, during the winter season. The soil is hard wood timber lands with clay soil.

ELMER REEVES: What comparative tests have you made with Wealthy top worked and root grafted?

J. L. HERBST: We have planted three-year old Wealthy trees on their own roots, and beside them placed the same variety topworked on Virginia crab, to determine the comparative growth of each.

W. A. BURNAP: Do you graft into the stem or the side branches, and to what extent will the experiments at Wausau be of benefit to us here?

J. L. HERBST: We usually graft in the main stem. One object in our experimental work is, to determine the hardiness of different varieties. The seasons there being more severe than in your locality, any variety that proves hardy with us certainly ought to prove equally so with you.

W. A. BURNAP: What special varieties do you recommend for your locality?

J. L. HERBST: Such as are mentioned in the paper; Windsor, Dudley's Winter, etc.

B. F. FERRIS: Do scions usually outgrow the stocks upon which they are worked?

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J. L. HERBST: Thus far we have found only one variety that will outgrow the Virginia crab as a stock. The winter of 1898 and '99 did not affect any variety of apples on the experimental grounds of our state. The Windsor apple somewhat resembles the Wealthy in flavor, but will keep longer, and I name this sort as one of the five recommended for planting in my section of Wisconsin.

JASPER THOMPSON: I have been led into much confusion by your discussions. Thirty years ago I commenced raising forest trees, but my hopes have been somewhat depressed by the statements as made by Mr. Guilford of Dubuque, who says that for forty-five years he has been engaged in the fruit business in Iowa, and that all the while with a view to good results. Now he tells us that the entire orchards of Iowa have been swept out of existence in the Winter of 1898 and '99, and that this must go into our report. He states further, that the only way to success is by the method of topgrafting on the Virginia crab stock, etc. He has drawn for me a picture by showing his trees to be all right, following one winter when there was three inches of snow on the ground, then the following year when there was no snow, the trees were all dead. Now does the business of apple growing in Iowa depend simply upon snow? What does snow signify? principally a light mulch, and I have something for that purpose which beats the snow, and it is no uncertainty. I put three hundred pounds of mulch around each of my orchard trees, at a cost of about fifteen cents per tree, and find this an excellent protection. Some kind of a covering to the soil is absolutely necessary. Some one has recommended blue grass, but I would as soon put fire into my orchard as to have it seeded to blue grass. Yesterday I went up to Mr. Ivins's grounds and observed the results of his efforts, and I want to say that I would rather have his record than a sixty foot monument. I have my orchard located on grounds where the conditions are exactly the opposite of Mr. Ivins' place. I have 3,200 trees on high rolling prairie land, and have not lost two per cent thus far. I believe the cause of destruction of orchards the past year or two to be principally due to unfavorable locations; low, wet land being very objectionable as an orchard site. I have expected my trees would last from twenty to twenty-five years, and I have taught my children to set out trees at about such intervals.

Should we not study the methods of raising hardy varieties of trees rather than those sorts that simply keep well? We would

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do well to look for methods whereby we may prolong the keeping qualities of the good varieties we already have. A neighbor of mine succeeded in keeping the Fameuse apple in good condition until the first of May, by simply packing them with alternate layers of potatoes in a barrel which was placed in the cellar.

All of my trees are wrapped or wound with prairie hay ropes. Some of this protection, which was applied four years ago, still remains on the trees. My man goes out about four miles from town and wraps about 200 trees a day, doing the chores night and morning. I have two trees near my house which have borne very heavily for twenty-seven years, and during all that time they have been heavily manured annually.

In preparing my ground for setting out trees, I use a four horse team, plowing as deep as possible, then mark out ground with plow both ways, crossing at the point where the trees are to be set. I have them set about eighteen inches deep, putting on one large pailfull of water to each tree, tromping down the soil thoroughly; following the setting of the trees with a disc to level down the ground. I raise no other crop on the ground and cease cultivation about July 1st.

G. A. IVINS: My greatest loss of trees was on the highest ground rather than the lowest.

W. A. BURNAP: For several years we have had mild winters, and our orchardists recommended clean cultivation, but since 1898 and '99, they now advise us to use some sort of cover crops.

L. B. DUMBOLTON: When orchards come into full bearing, why not seed to clover?

Answered by several members: It is a good plan.

W. H. GUILFORD: At the Southeastern Society, one old orchardist recommended grass in the orchard and nearly all the members favored the plan, but Mr. Watrous dissented. I say that a blue grass mulch in the orchard is the best mulch you can have.

O. W. MOORE: My experience does not apply to thirty or forty acres of orchard as I have only one-half acre. I cultivate first, two or three years, then sow alfalfa. Cultivating six to eight feet about the tree then mulch them in early winter.

J. S. TRIGG: Have it go on record that alfalfa, pigeon grass, buckwheat and etc., all except blue grass are good in the orchard.

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THE SIX BEST VARIETIES OF APPLES FOR THE FAMILY ORCHARD, TWO SUMMER, TWO FALL AND TWO WINTER.

BY B. F. FERRIS, HAMILTON.

Hardiness of tree, productiveness and demand for the fruit, puts the Oldenburg clearly in the lead as a summer apple. For second place, Tetofsky, Yellow Transparent, Charlamoff, Whitney No. 20 and others deserve notice, but because of its fine quality and early ripening, I put Tetofsky second. There is no question about Wealthy and Plumb's Cider being the two best fall apples here. For winter we are always having new foreigners and new seedlings crowded upon us as hardy keepers. The list of failures is long, but the other list is very short. The Walbridge, with all its faults furnishes us with more winter apples than all the others. Therefore, I will name it first and put Northwestern Greening second. The latter is far and away ahead of the former from present appearance. It is a large showy apple; keeps well, and will sell well. The tree looks and acts like a good one and I recommend it, and if after it bears a good crop and a test winter follows, it still acts and looks as well as at present, I will gladly give it first place as a winter apple.

Iowa Blush, Gano, Roman Stem and Allen's Choice, also some of the Russian importations should have mention and should be planted for variety.

In my opinion, when we grow winter apples in northern Iowa successfully for market, it will be on bodies hardier than their own.

B. F. FERRIS: I have named the Duchess and Tetofsky as summer apples for family use and Wealthy and Plumb Cider for fall. As to the winter sorts, I am not certain. For one, I will mention the Northwestern Greening, for the other one, I have named the Walbridge. I can show Walbridge trees set twenty-one years ago, now, in blue grass sod, from which car loads of apples have been sold. The apples will grow large if well fertilized, the tops thinned out and not allowed to over bear. I have in mind one orchard of this variety, which has been manured heavily and pastured with sheep and hogs and the fruit does not scab, while another orchard near by, not treated thus, scabs badly.

J. C. FERRIS: I am a little surprised that my brother recommends the Walbridge apple as highly as he does, yet, I can confirm his statements somewhat. I paid one man seventy-five dollars for the apples that one season were produced on trees that he paid me twenty-five dollars for.

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What we want is a variety that will pay. Malinda is good, but I prefer Walbridge.

C. G. PATTEN: In reference to Mr. Ferris' list, I wish to say that had he given us the kind of soil and the location where the Plumb Cider and Walbridge grew, we might be better able to judge as to their value, because the local conditions have much to do with the success of those two varieties. When you go into soil somewhat mixed with sand, I should advise letting these sorts alone.

JOSEPH HUNT: I planted at one time one hundred different varieties, including Plumb Cider and Walbridge. Most of the two latter sorts are still left while all others are gone.

C. G. PATTEN: I wish to inquire of Mr. Ferris, to what extent he has grown the Gano, and what he now thinks of it?

J. C. FERRIS: As long as the Gano does as well for me as it has in the past, I shall speak favorably of it in our society. I have had good crops from the Gano and little from the Salome. I also have the Gano top-worked and it is doing well.

C. G. PATTEN: Did the wood of the Gano color in the winter of 1898 and '99 like that of the Fameuse, Ben Davis and some other varieties?

J. C. FERRIS: A little, but not to such an extent as to injure the tree. I hope others may have as favorable experience with it as I have had during a fourteen years trial.

THE FOUR BEST VARIETIES OF STRAWBERRIES AND HOW TO CULTIVATE THEM SUCCESSFULLY.

BY G. A. IVINS, IOWA FALLS.

We have read and reread an old horticultural volume published in 1849. Crude as it may seem, in some respects, still, some valuable lessons in strawberry culture can be learned from it. The conditions that are requisite in plant life are strongly emphasized in this aged book. Every year's experience confirms the fact that small rootlets require a deep, friable loam. The finer the soil is made, the stronger and more readily the plant will grow. This, in our opinion, is one of the most necessary requirements in strawberry culture, and we want to impress this idea more than all others, that plant life cannot perform its complete work under poor quality of soil and slipshod culture. Show us, if possible, the ground too rich or too finely pulverized, that it does not increase the yield and size of the berries. In this paper we have not the time to discuss the little details of growing strawberries, as this ground has been traveled over so often that every important point has been said many times over.

To prepare the ground, deep fall plowing and replowing in the spring is far better than only one plowing. Harrow the ground thoroughly, and

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should it be lumpy, go over it with a roller, this will crush the lumps and level the ground. Heavy rooted plants from a propagating bed that never bore fruit are the best plants to set. We would not advise planting plants taken from an old bed, or those having a long crooked neck. Such plants might prove a disappointment in producing sufficient fruit for a square meal. For a full matted row, we have never found four feet to wide apart for most any variety and about twenty inches apart in the row. Such varieties as Parker Earle and Bubach can be planted closer together. Every grower has his method of setting plants and no doubt but every one succeeds in getting a good stand of plants. Our planting for many years has been done with a potato hook, which we find the easiest and best of anything we have tried. Of late years we have used the Foster's fine tooth and Planet Junior cultivators for the strawberry field. These cultivators can be adjusted for deep or shallow work and the great advantage in them is, they do not roll up the moist soil for the sun and wind to dry out.

One essential in strawberry culture, is to keep the ground level and work in every way to conserve moisture. Cultivating and hoeing often and just as long as the beds can be worked. To make this work comparatively easy, it is better to cultivate when there is no weeds to be seen. After weeds have nicely rooted it is not always an easy job to get rid of them. Working a strawberry bed over for a second crop on some soils is very tedious. We believe we have devised a scheme whereby the work can be made easier and at the same time making the ground in better condition. The first thing, is to mow the bed as soon as picking is over, rake and haul off the litter, or burn it on the field, but be careful to not damage the vines by fire. Then use a disc cultivator and adjust it so it will leave the center of the old row eight or ten inches wide. Go over the rows until the ground is thoroughly pulverized, then cultivate and hoe out weeds in the row. Cultivation should continue until the runners start to form. From such a bed, in a favorable season, the yield will nearly equal a new bed. The four best varieties for cultivation is a difficult question to decide when there are so many varieties that are winning laurels. It is true that there are not a large number of varieties that do well on all soils and in all climates. If winters like the two past, were to continue, we surely would name the Crescent and Robinson as being the two hardiest varieties upon our ground, but we do not anticipate that coming winters will be so damaging to our vines. By this time, nearly all of us have learned that Beder Wood, Warfield, Haverland and Clyde are among our very best for general planting. Not all of these are good shippers, or the best in quality, but they do give the grower better returns than many others. Good shipping varieties are not numerous. The Robinson, Parker Earle and Fountain are very good. These varieties are staminate, yielding good crops of fine berries. We have planted Parker Earle largely on low, wet ground, and its heavy crop of berries are immense, but upon dry ground it is a failure. We cannot pass by the faithful and reliable Crescent, which we believe has produced more quarts of berries than any known variety. Its extreme hardiness no one can doubt. Its yield in different soils and climates has not been surpassed. It has been universally planted from east to west and after a quarter of a century its vigor and productiveness have not been diminished.

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J. S. TRIGG: Now which four varieties do you consider best among the entire list?

G. A. IVINS: Bederwood, Haveland, Warfield and Clyde.

W. A. BURNAP: What material do you cover with?

G. A. IVINS: Stable manure, and I put on just enough to fairly cover the vines, then remove it early in the spring.

W. A. BURNAP: Don't you get your beds full of foul seeds?

G. A. IVINS: No, not to any great extent.

C. G. PATTEN: You prefer the four varieties you have named for market, do you?

G. A. IVINS: Yes, both for the market and for home use.

C. G. PATTEN: Why do you omit the Crescent?

G. A. IVINS: It is too soft for handling.

J. L. HERBST. In regard to Crescent, its dull color places it below the Warfield as a market berry. Clyde and Haveland have good color.

J. S. TRIGG: Has Mr. Ivins tried the Gandy?

G. A. IVINS: Yes, but discarded it years ago.

J. S. TRIGG: A neighbor of mine, at Rockford, during the past season sold from fifty-five square rods, 2120 quarts of Gandy strawberries at from ten to twelve and one-half cents per quart after other berries were gone.

A. T. ERWIN: Will Mr. Ivins name for us his best early berry?

G. A. IVINS: I regard Bederwood as being about the best.

C. G. PATTEN: I would like to ask Mr. Ivins if he does not regard the statement made by Mr. Trigg, in reference to the Gandy strawberry, as rather over reaching the facts.

G. A. IVINS: That depends somewhat upon the conditions of the season and other considerations. Such results may be an exception to the general yield.

W. A. BURNAP: Do you consider the Bederwood as good a fertilizer as the Clyde?

G. A. IVINS: I do.

J. L. HERBST: One grower at Sparta, Wisconsin, from four acres of Gandy strawberries made a small fortune, but they will not do well on light soil; they need rather heavy clay and then fed well with wood ashes.

B. F. FERRIS: My beds of strawberries which I covered with stable manure last winter killed out, while those covered with straw came through nicely.

J. L. HERBST: At this meeting I have heard for the first time that anyone has succeeded with covering strawberries with fresh

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manure. I have in mind, six acres which were destroyed by such a method.

W. A. BURNAP: I have two acres of thickly matted rows. Shall I thin them out, or let them remain as they are?

J. L. HERBST: I think I would not disturb them.

B. F. FERRIS: It is all right to cut off the early runners to prevent vines from forming too densely, providing the latter part of the season is favorable for producing new plants. Otherwise, dry weather during late summer might result in a poor stand of plants and consequently a light crop of berries the following season.

J. S. TRIGG: My experience convinces me that if a man can devise some means of irrigation he cannot only double his crop for that season, but by this means also prepare his beds for a good crop the following year. I have illustrated this fact by actual experiment.

EUGENE SECOR: I wish to inquire of Mr. Herbst, what he considers a good yield of strawberries per acre?

J. L. HERBST: From 150 to 200 bushels.

ELMER REEVES: Will Mr. Herbst please state what has been the largest yield at Sparta?

J. L. HERBST: I cannot give the exact figures.

G. I. MCCHESNEY: The first winter after plants have formed I cover my beds with the coarsest slough grass I can get. The second season I use well rotted manure, and have never had my berries killed out when thus treated, except two years ago when everything suffered so badly. I cultivate as late as possible. I like to kill out the last formed plants.

WEDNESDAY AFTERNOON.

FIFTEEN YEARS WITH THE RUSSIANS.

BY O. A. KENYON, M'GREGOR.

The winter of '55 and '56 was peculiarly destructive to the nurseries, and the few orchards that had been planted in Iowa and adjoining territory. Northeastern Iowa was then but scarcely settled, and only a few of the first settlers had planted fruit trees. A few years later, however, when those first planted trees that had survived began to bear, and their fruit was shown at the fairs and in the show windows of the village stores, an interest was revived in the planting of orchard fruits. This interest was cultivated and intensified by itinerant tree agents, with the result that every owner of an

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acre of ground bought at a high price and planted as many trees as he felt able to pay for. During the next twenty or more years, and up to about 1884, we were sometimes cheered with apparent success, and then depressed with partial or total failure. A large percentage of our fruit trees, not only of the first but of a second planting, had been consigned to the brush pile or the kitchen stove. But about this time there were whisperings in the air that far off Russia (whose active sympathy had helped to sustain us in a former and national calamity) could supply us with fruit trees, whose hardiness was equal to that of our native white oaks. Hope revived,—with the eye of faith we saw in the future great orchards of Russian fruit trees, bidding defiance to the heat and cold, the floods and drouths of our Iowa climate. Our apple bins and apple barrels were to be enlarged in anticipation of enormous crops from our new orchards. By the use of the very best of American fruits, we began to cultivate our tastes, our palates, so that we might fully appreciate the superior excellence of the Russians. But like many other flattering hopes, born of ardent desire and based upon untried experiments, these were not to be fully realized.

In the winter of 1884 and 1885 the writer received from Prof. J. L. Budd the proposition to take hold of experimental work, for the purpose, principally, of testing the action of Russian fruit trees in the soil and climate of Northeastern Iowa. My experience in orcharding during the previous twenty or twenty-five years had been so discouraging, that I had about concluded to give it up. It was presumed, of course, that fruit trees native to Russia, with its reputed rigorous climate, would find the conditions of an Iowa climate more congenial to their nature and conducive to a long, healthy, vigorous and fruitful life. So the proposition was gladly accepted, and in the spring of 1885 over fifty varieties of apples, twenty-three of pears, and seven of cherries were received. Additional stock was received in future years, making in all, some sixty varieties of apples, thirty of pears, and fifteen of cherries. The trees received were all small, one year old, and many of them very deficient in good roots. They were put up in packages of two or three together, and labeled with a name or number, as it proved afterwards in several instances the two or three trees in a package were not all of the same kind, and I have reason to believe, that in several other instances they were not true to name or number, for, in both tree and fruit they differ from the printed descriptions of them that I have seen in the bulletins and elsewhere.

The strongest of these little trees were planted in orchard spaces where they were to remain, and the weak ones in nursery to be nursed into a condition for permanent planting. Some of them failed to grow, and in all of them growth was very slow during the first two or three years, but after that those that had not been killed by blight, or other causes, made a fairly good growth, and as they get older seem less subject to blight; in fact; apple trees have been quite free from it for several years past. But not so with pear trees during the past thirty-five years; besides the thirty varieties of Russian pears, I have planted fully as many varieties of American kinds, probably in all nearly or quite 200 trees; I have now only three trees left, blight having killed the rest.

The present condition of some of the apple trees seem to indicate that they have passed the prime of life, and that in the near future they will be

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ready for the grub hoe and brush pile. Of the sixty varieties and 163 trees of Russian apples received for trial, there now remain about fifty varieties and ninety trees. Now as to the fruit. Some of it is large; most of it is of suitable size for market, but deficient in coloring. Some kinds are always so knotty and ill shapen as to be unfit for market, and nearly all of it has a peculiar acerbity of flavor that is not relished by the average American palate. While this flavor never entirely disappears, it is somewhat modified as the fruit attains a condition of perfect ripeness, just when decomposition or rotting is ready to set in. Were I to plant another orchard (which I don't expect to do at my age, 79 years) it would be with trees of American origin, rather than any Russians that I am acquainted with. I have no word of censure for any one who has been identified, or instrumental in the introduction of Russian fruits. Our iron clads and steel clads have proved to be so only in name. It seemed necessary that something should be done to secure trees that would endure our test seasons, whether of winter or summer. Whatever the final result may be, in the effort to secure foreign trees and fruits adapted to our wants, I regard those who engaged in such service as having been actuated by the most honorable motives, and entitled to the good will of their fellow citizens. While many of the varieties seem at present to be sufficiently hardy to make them useful as stocks for top working tender kinds upon, I believe it is yet too early to determine what particular varieties will prove most useful for that purpose. Individual trees of many of our American varieties will live and do fairly well for a period exceeding that during which the Russians have been on trial here. And it is very likely that the next ten years will witness the weeding out of a great many kinds that up to the present have seemed worthy of confidence. At present we do not know what Russlan varieties are more hardy than the hardiest of the Americans; hence, our efforts to produce trees of superior hardiness by the mingling of Russian and American blood by cross fertilization, is no more certain of success than the crossing of hardy American sorts. Another thing: the quality of the fruit is a matter of no less importance than the hardiness of the tree. The cultivation and fixing of the tastes, by the habitual use of certain kinds, has created a demand, on the part of consumers of American fruits, in this and other countries, for those kinds whose flavor comes nearest to a certain standard. That standard does not, and cannot include the flavor peculiar to the Russian. Now a Russian fruit that has been grown for hundreds or thousands of years in the soil and climate of its origin, possesses in its flavor a certain pre-potency of energy that will not entirely yield to the caressing influences of a Jonathan, a Grimes Golden, or a Roman Stem. While then, we are obeying the injunction to "prove all things," let us "hold fast to that which we know to be good."

THINGS NEW IN SEEDLING PRODUCTION.

BY C. G. PATTEN, CHARLES CITY.

In treating this subject I cannot do better than to refer to some things that came under my observation at the Iowa State Fair, and also at the state fair at Minnesota. The question of plums had excited considerable interest

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at our own state meetings. I shall not need to refer to the older sorts at this time. At the Iowa state fair there were shown some new varieties. One in particular, which I shall describe as a perfect freestone, quite firm in flesh and meaty, perfectly free from astringency, yellow in color and of good size. This plum was very sweet, if anything too sweet, and perhaps lacked sprightliness, but it certainly is worthy of notice.

Among the new seedlings competing for premiums there were some twelve or thirteen varities that were prominent before the awarding committee, the plum which I presented was awarded only fourth premium and I had thought it a good variety. The seeing of a plum simply at one meeting does not fully settle in one's mind the question of its value. I noticed some of the newer kinds that were equal in size to the Hawkeye and the Wyant, and I believe we could dispense with those two sorts and yet have a good assortment of plums left. In apples I presented two varieties in the list of seedlings for a premium. On one, Perry Russet No. 3, in seedling production, I received the first premium in the state exhibit, and I had previously received the premium offered in the State Horticultural Society. The season of this sort is from February to March. It has a good appearance and is of good size and the same may be said of its quality, being better in this respect than the Northwestern Greening and hardier in tree as I think.

I am aware that in speaking of these things in which I am so deeply interested, I am liable to be criticised by the public, but I shall endeavor to speak with all frankness. On another variety, that I call Ben Davis No. 3, and probably originating from that sort, I received second premium. I also exhibited another seedling of Ben Davis which I named Ben Davis Sweet. Considering the size and quality of the fruit and hardiness of the tree, I regard it as being the best sweet apple that we have. I make mention of another variety, a seedling of the Fameuse and named Fameuse No. 1. From my own experience with it and from the favorable reports of it behavior from different sources, I consider it of great value. It is an early and constant bearer of fruit, large in size and of good quality both for eating and cooking purposes and following in season the Duchess. In comparing it with Charlemoff, I have given the decided preference to Fameuse No. 1. Brilliant with its pleasant flower, high color and good size, and which received the first premium at the Iowa State Fair some years ago, again won distinction at the last fair.

In reference to the Minnesota Horticultural Society, I may say that for real energy and activity among its members, their activity is beyond anything I have ever witnessed at any meeting, and the wonderful exhibits displayed upon the tables were worthy of a state three times the size of Minnesota. I would be glad if our state exhibit could equal theirs in this respect. One man presented a collection of about one hundred and sixty varieties, nearly all of which were comparatively new apples. These, however, were produced in a haphazzard way and were consequently small in size, there being none among the whole collection worthy of special mention, and yet something desirable may come from some of them.

At the recent meeting of the Southeastern Iowa Horticultural Society my attention was called to a fruit that is comparatively new, in Iowa at least, and that is the Lone Tree peach. Considerable attention is being paid to it in that section of the state. It is of good size, of excellent quality and said

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to be as hardy as the Bailey peach. Elwood Tatum, of West Branch, is taking considerable interest in peaches and has quite a number of different varieties in cultivation. In my opinion, before another generation passes, southeastern Iowa will be a vertible peach country.

As to the plums they had on exhibition at the Minnesota State Fair I will say that their display of the newer varieties was the largest in size, for the number shown that I have ever witnessed. There were some twenty or more sorts that in appearance seemed to equal the very best that we grow in Iowa. The committee on awards worked very faithfully on the large list and finally gave Martin Penning the first premium. Continuing their investigations, they reduced the very excellent exhibit to three varieties. Mr. Wyman Elliott being the expert committeeman. As those who were called in were testing the quality of these, your speaker was permitted to bring forward two of his seedlings, and after a careful, thorough, informal testing, two at least of the four judges pronounced one of them "delicious," the finest in quality of any native plum that they had ever tasted. This plum is a seedling of the Stoddard. And still the work of improving and developing the plum goes on in Minnesota and the adjoining states, and is destined to rapidly merge into varieties as fine in quality and other desirable characteristics as is found in any other species, with the added quality of adaption to our climate.

J. S. TRIGG: I wish to ask Mr. Patten from how far north were apples exhibited at the Minnesota society and state fair?

C. G. PATTEN: From five miles north of St. Paul. Mr. Frankland of Manitoba, also had apples on exhibition at the same time.

J. S. TRIGG: Do you think the quality of the apples exhibited at the Minnesota fair was equal to the quality of those exhibited at Des Moines?

C. G. PATTEN: No, from the fact that many of them were Russians.

J. C. FERRIS: Did you discover any difference in the quality of the same varieties composing those shown at the Minnesota state fair with the Iowa exhibit?

C. G. PATTEN: An apple contains its highest quality in the locality to which it is best adapted. The Duchess is adapted to the latitude of Minnesota, even as far north as St. Paul. But apples grown far north in a humid climate and near lakes are usually of a higher quality than that of the same varieties grown in Missouri.

J. C. FERRIS: We, at one time, decided at our horticultural meeting, that the quality of a fruit attained its most perfect development at the farthest northern limit of its adaptability.

C. G. PATTEN: The locality where we plant varieties of fruit has more to do with its habits and quality than some are aware of and is a matter of much importance to the planter and producer.

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WHY THE PEOPLE OF IOWA DO NOT HAVE ONE-THIRD OF THE APPLES THY WANT.

BY R. P. SPEER, CEDAR FALLS.

Very early varieties of the apple have been offered frequently for sale in the grocery stores in Iowa, before the last of July. But generally good, well matured Iowa apples have not been offered for sale before the first of August. For from two to two and a half months afterwards, apples are so plentiful, frequently, that they cannot be sold for more than from twenty to thirty cents per bushel, and it is not uncommon to see many loads of inferior apples like the Haas, going to the cider mills because there is no demand for them at any price. After the first of November apples bring good prices because they are scarce and for nine months afterwards three-fourths of the apples that have been used in Iowa were grown in other states. It is well known that when winter apples can be grown successfully, orchardists can afford to sell them for $1.25 per barrel, but generally they are sold by Iowa grocerymen for from $2.50 to $3.00 per barrel and the result of fixing such prices on them is, that three-fourths of the people cannot afford to use them at all and the other fourth uses them in very limited quantities. It cannot be said that Iowa farmers use but few apples because they have failed to plant apple trees as it is well known that most of them have planted orchards, and replaced dead trees frequently.

Thousands of Iowa farmers and nurserymen have experimented with root-grafted winter apple trees for more than thirty years, but the results of their experiments have been very unsatisfactory. We have entirely too many summer and fall apples, but we do not have winter apples that have the characteristics that are wanted by fruit consumers. I have tested more than one hundred and fifty kinds of American apples thoroughly during the past thirty-five years, but none of them have proved to be hardy or profitable in three-quarters of Iowa when they were root-grafted. Root-grafted trees have fared best on the loess soils of southwestern Iowa and in certain localities farther north and east where the water level was not more than from twenty to thirty-five feet below the surface of the ground. I have also tested thoroughly two hundred and thirty kinds of the most highly recommended Russian apples during the last thirty years and I have found that many of them are hardy even on unfavorable soils, that a few of the very hardy varieties are really excellent summer and fall apples, but I have failed to find a good winter apple among them.

What shall we do to enable us to grow the quantity of good winter apples which the people of Iowa will want in the future, is an important question which should be answered soon. Only a few weeks ago, very desirable premiums were awarded to Iowa exhibitors of apples at the Paris exposition and

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the exhibits of Iowa apples at Philadelphia, New Orleans, Chicago and other great expositions, were very satisfactory to the parties who furnished the apples, but they were deceptive, as they caused foreigners and people from other states to believe that Iowa orchardists had no reason to complain about tender fruit trees or short crops of good winter apples. Last year 185,000 barrels of good American apples were shipped from the city of New York before the 15th of November, and other tens of thousands of barrels of apples were sent to European markets from Boston, Philadelphia and other seaports. Such reports are not satisfactory to Iowa fruit growers when our grocerymen are obliged to order hundreds of car loads of winter apples every year from New York, Michigan, Missouri and other states or do without apples.

What can we hope for, as western nurserymen go on root-grafting the Walbridge, Harry Kaump and other winter apples of inferior size and quality, which are tender also, except on the best orchard cites, and when too many of the other apples named in their catalogues will not keep in a reasonably good cellar later than the first of December. The people of Iowa are not satisfied with a little flood of apples during August and September, but they want them of good size and quality from the last of July until the first of the following June. They want hardy and productive trees, but they do not want little apples like the Longfield, Repka Malenka and Iowa Blush, nor apples of inferior quality like the Haas and Walbridge. Nine-tenths of the losses in our apple orchards have been caused by bark scalding on the bodies and in the crotches of the trees, and it was well known more than thirty years ago, that most of the American apples were much hardier and that they were not liable to suffer from bark scalding when they were top-grafted on very hardy trees like the Duchess.

In 1872, I top-grafted several young Duchess trees with such tender varieties as the Black Oxford, Pewaukee, Wealthy, Ben Davis, Iowa Blush, Willow Twig, etc., and all of them are in a healthy condition now, except three trees that were broken down by a storm and two that were root-killed two years ago. The Duchess is not a good stock on which to graft other varieties, because it drops much of its fruit prematurely in very dry summers and other varieties top-grafted on it have the same fault. For the same reason, the Hibernal, Recumbent and many of the other hardy Russian apples should not be used as stocks for other tender varieties. In my orchard, the Virginia crab and Whitney have proved to be good stocks for many kinds of American apples. The trees to be used as stocks should be planted in the orchard when they are three years old, but before planting them I would cut back all their side limbs at points within three or four inches of their bodies. Two years afterwards their tops should be changed by whip-grafting limbs within five inches of their bodies as early in the spring as the weather would be suitable for such work. The cost of top-grafting such trees would not be more than from eight to ten cents per tree. Any man of common sense can learn to do such work in a few minutes and only a little practice is necessary to enable him to do it rapidly and well.

A fair retail price for Virginia crab or Whitney trees would be 15 cents per tree, and when top-grafted they would not cost more than 25 cents per tree, if a man should be hired to do the grafting. My experience has satisfied me, that with reasonably good care, such trees on only third rate

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orchard stocks would live and bear good crops of fruit for thirty-five years or more. But I would expect root-grafted winter apples of the same varieties to fail at any time after they were old enough to bear a fair crop of fruit, on account of bark-scalding. Bark-scalding of the bodies and crotches of the trees and root-killing have been principal causes of the losses in our orchards. In April, 1873, a great many trees were killed in Iowa on account of the sudden thawing of their main roots; but where they were protected by stubble, weeds or blue grass sod no trees were injured. Again in the winter of 1898 and 1899 many hundreds of thousands of apple trees were destroyed in Iowa by root-killing. But my experience in the spring of 1899, was like that of 1873, as I could find no trees in any of my orchards which had injured roots, except in two or three places where the surface ground was bare. To avoid the root-killing of trees we should give their roots better protection. On well drained orchard sites I would plant apple trees so that their roots would be ten inches below the surface of the ground.

To grow larger and better apples than we have grown in the past we must use more stable manure and clover or rather leguminous plants. And to fill the great gaps between the times when Iowa apples are plentiful, we should plant a much smaller number of summer and fall apples and more winter apples. But do not forget that the planting of root-grafted winter apples on two-thirds of the orchard sites in the northern half of Iowa is like throwing time and labor away. As bark scalding on the bodies and in the crotches of the trees and root-killing has been the principal causes of our losses, we should top-graft apples hereafter on hardy, vigorous stocks, which do not scald and, plant them much deeper than formerly to prevent root-killing. The following summer and fall apples are hardy, productive and of good size and quality, and it is safe to plant them when root-grafted; viz., Duchess, Charlamoff, Fonaric, Vassil's Largest, Whitney and Briar's Sweet Crab for pickles. I would want the following varieties, also, which should be top-grafted on the Virginia crab or Whitney, viz., William's Favorite, Cole's Quince, Early Colton, Wealthy, Pewaukee, Patten's Greening, Jonathan, New York Pippin, Winesap, Willow Twig, Grimes' Golden, Black Oxford and Ben Davis.

WHICH ARE THE BEST TIMBER TREES FOR THE MIDDLE NORTHWEST.

BY E. H. S. DARTT, OWATONNA, MINN.

In trying to answer the question as to which are the best timber trees for the Middle Northwest I shall not attempt to exhaust the subject, but will make a few statements and leave it with you to supply deficiencies. To aid us in forming correct conclusions let us imagine the condition of our country 100 years from now. When our native forests are mostly used up we may recognize varieties that we would not think of classing in the timber list at the present time.

The Cottonwood on account of its wonderful growth will likely produce more wood in a given length of time than any other variety. I saw cottonwood

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boards in use in Kansas that seemed very much better than no boards at all. Soaking in some cheap solution may prevent warping and make it a valuable tree.

The White Elm is a noble tree, but as a timber tree does not greatly surpass the cottonwood in value.

The Soft Maple is good for firewood and bodies can be sawed into floor boards, wagon axles and other timber where a strong, close grained wood is needed.

The Black Walnut is a native here and may take a prominent position in the timber list, but I don't think great wealth will ever be realized from its cultivation. I have a pedigree tree; the nut grew in Kansas, germinated in Wisconsin and the tree is now thriving in Minnesota. The black walnut has been said to be poison to apple trees. My pet is surrounded by apple trees which are doing just as well as they would the same distance from any other rapidly growing tree.

The Scotch Pine is a rapid grower, consequently coarse grained, admits of a fine polish and I believe will fully equal the Georgia Pine as a finishing lumber. My den is cased with Scotch Pine of my own growing.

I regard the European Larch as the most valuable timber tree we have, it is a tree of great hardiness, rapid, erect and uniform growth and will be found very useful as hewing timber, telegraph, electric light and telephone poles. I have 26 trees planted in a continuous row 12 feet apart set about 22 years ago. Every one of these trees, except two that have been cut, are now in perfect health, of nearly uniform size, measuring 3 feet 7 inches in circumference 2 feet from the ground and are about fifty feet high. I set one American Larch in the row, it never made half the growth of the others and died out years ago. This is one of the rare instances where the Europeans have licked the Americans. Great durability is claimed for the European Larch. The sap wood rots quickly under ground. If the heart wood is very durable it adds greatly to the value of the tree for poles. I predict that at no remote day iron in the form of hollow cylinders will take the place of wooden poles. When our buildings are constructed of marble, iron and glass with plaitings of silver and gold, then fires will be less disastrous and our beautiful trees may be left for shade and ornament. Then people can say good-bye timber without a pang of regret. 'Tis best always to look on the bright side.

MY EXPERIENCE IN THE FRUIT GARDEN.

BY A. E. BENTS, CRESCO.

During the last thirty years, I have been experimenting and growing fruits in Howard county, and twenty years ago I could have told you all about the business, how, when, and what to plant, and how to make a grand success. But after twenty years had passed, I learned one thing that I did not know before, and that was, I did not know half as much about the business as I thought I knew twenty years before, and I do not believe that I am the only one that thinks he graduates in five years, and although I did not attend the horticultural meetings for many years I did not fail to read all the

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reports from year to year. The names of the members were as familiar as they are to-day. I well remember of reading of the fine crops of fruit, and shipments of apples made by some members, and later on I had the opportunity of visiting their fruit farms for the purpose of getting some pointers in fruit growing and that was just what I got. I learned more right there than I had for years; that was, there was deception in a nurseryman. I found that the fruit mentioned at the meetings must have been grown by his forefathers in the East, for he did not have a variety of fruit for his family. Later I visited a farmer in Minnesota who did not claim to be doing much in the fruit line, but if my memory serves me right he had shipped six carloads of apples that season, and all grown in a twelve-acre orchard on his farm. There I could see the different varieties of apples and the condition of the trees. The object of this paper is to call the attention of the members of this society to the necessity of changing their time of meeting so that we can visit fruit growers and orchards in fruit season, and may see what varieties of fruit are growing and the condition of trees, soil, etc. I believe that soil and location have more to do than varieties. It will not do to condemn or recommend a variety for general planting simply because it does or does not do well on a certain soil or location. And I suggest that we either hold a summer meeting or change our regular meeting to August. I believe that we will be greatly benefited by so doing.

PROTECTION OF NURSERY STOCK FROM INJURY BY WINTERS.

BY GEO. J. KELLOGG, JANESVILLE, WIS.

What would we not give each fall to know this secret? This question is not given with an answer, but that we may combine our experience and get as near a satisfactory answer as possible. There is one very commendable feature in horticulture, I have never known any secrets except in New York state. We are mutually dependent on each other in the west for that experience that will lead to success.

After the past two winters we need more light. Will mulching save our trees following a very dry fall? If properly applied I believe it will. I think if a liberal straw manure mulch is applied after the trees are banked up with the plow in October, it will save from the root killing; that manure where shavings are used for bedding I believe is best. Oats sown in September I have known to be a benefit and then again a failure. We are trying, with the greatest promise of success this season vetch; but this season no one expects any trouble. We are trying also buckwheat, peas, and still are mulching with manure. Above the snow line there is little trouble. One of our customers in Minnesota by mulching, saved his yearlings, while his fifty thousand two and three year old trees were all killed two year ago. He only mulched the one year, and he mulched heavy.

Every nurseryman feels the necestity of a tree cellar large enough to hold all his tree orders for spring. This has led up after our loss two years ago to build a cellar for winter protection. I think this is the safest plan for trees ready for the market. Two years ago trees that were well heeled outdoor and well wet down, with a large lot of roses were an entire failure, and

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I believe every tree we sell to be set out, or heeled outdoor in the fall, is a damage to our business. This fall I think it may be safe to plant or heel out. Such a winter as two years ago has never before occurred, and we hope may never come again.

The question is can we make things safe without the needed snow protection. We cannot dig and transplant with profit our young stock. We must devise some means to protect them where they grow. This seems to me to be the question of greatest importance among nurserymen and fruit growers at the present time. While we wintered very safe at Janesville many of our nurseries north of us suffered very heavy loss last winter. I hope the members of your society will give us more light.

I cannot be with you at your annual meeting.

WEDNESDAY FORENOON.

GENERAL DISCUSSION ON SPRAYING.

J. C. FERRIS: The subject is comparatively new to all of us, yet it is of great concern to fruit growers in general. Nature furnishes us with both friends and enemies, and there are millions of insect pests and many fungus diseases to which our orchards and fruiting shrubs are subject, and we must employ the things of nature in order to destroy these enemies of the fruit grower. The proper time to spray and the materials with which to spray are important matters to consider and all needed information upon these questions has been furnished us in the various bulletins and catalogues and together with these instructions we should use our best judgment. For extensive work one needs a wagon in which a barrel spraying machine can be operated, driving between the rows, spraying one side, then the opposite side of the row on the return. By this means a ten acre orchard may be sprayed in a half day. If one such machine could be owned and operated by some person in each neighborhood, he could do the spraying for all his neighbors. If we would have sound, choice apples we must spray our trees. Occasionally someone may have sound fruit without spraying. Mr. Harriman, of Hampton, pastures his orchard with sheep and hogs, and by this means many of the worm pests that naturally effect the orchards are destroyed before they get in their work. I sprayed my orchard once during the past season and my apples were much smoother than when spraying has been neglected. Others report the same results. I sprayed about one week after

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the petals had fallen, using enough liquid to well cover the fruit and foliage.

A. T. ERWIN: At the experimental station at the college, we have resorted to spraying to destroy the strawberry leaf roller, but with poor success as the insect is so securely encased on the inside of the rolled up leaf. We have sometimes set fire at one end of the rows and burned them out.

C. G. PATTEN: In one portion of my Duchess orchard the crop was practically destroyed by fungus. Then we tried spraying as a remedy and had good results. One buyer from Minneapolis said the fruit from those sprayed trees was the finest he had handled that season. We cannot expect complete success from spraying simply one season, but by repeated applications year after year we can surely succeed in ridding our orchards of many of the natural pests and diseases affecting them.

J. L. HERBST: I have had chickens running in one plum orchard of about 100 trees, and the plums in that orchard seemed to be smoother and nicer than in another orchard where hens were not allowed to run.

C. G. PATTEN: Hens in scratching would naturally destroy many young insects that might be hatching in the plum orchard. I made an experiment in spraying for the aphis with kerosene emulsion and one application nearly rid the trees of this bothersome pest.

A. T. ERWIN: In spraying for the cabbage worm, the application should be made when the insect is at work on the outside of the leaves, and not after the eggs have been deposited, and then call it a failure if it does not meet your expectations.

O. W. MOORE: A teaspoonful of Paris Green to a pail of water will not poison anyone, and is sufficient to prove effectual in destroying the worms.

PRESIDENTS' ADDRESS.

BY C. F. GARDNER. OSAGE.

Members of the Northeastern Iowa Horticultural Society:

Again we meet in annual session to compare notes of observations made during the year 1900.

Our last annual meeting, held in the wide awake and beautiful city of Cresco, where we had an interesting and profitable session, listening to many valuable papers upon the various branches of horticulture, and discussing the same, which brought out varied experience in our work, of this and kindred

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societies whose members were present with us. It was a successful meeting and we have every reason to believe that this session, held as it is, at the home of that worthy veteran in horticulture, our treasurer, Mr. G. A. Ivins, will be one of the most interesting and profitable that we ever attended.

We meet in this progressive city of Iowa Falls, to greet old friends and to form new acquaintances among the horticulturists who have gathered here from all parts of northeastern Iowa.

It is with great pleasure we greet the delegates now present, from our sister societies, not only of this state, but from adjoining states. We give you all a cordial welcome and hope you will feel free to take part in our discussions. We are glad to meet the new members who have recently joined this society, and hope they will find it to their interest to become permanent members of this organization. Let everybody feel at home and take part in our deliberations.

The State Horticultural Society meets at Des Moines, Iowa, on the second Tuesday of December; you are all invited to come and meet with us. Let all who are interested in fruit growing go to that meeting if possible.

Horticulture is an ancient and honorable calling, it reaches far back in the dim and musty records of antiquity. It is as old as man. It was first among the many employments of man. The business of horticulture is refining. The coarse and brutal nature will never be found in one who loves the flower, plant or tree. A man cannot be a good horticulturist without thinking and reading and in order to advance any principle we must organize and hold conventions, for this purpose you are gathered here. It is now a well known fact that nature's way seems to be to continue the process by seedling and bud variation till forms are produced best fited to the new conditions. Bearing this in mind the plan of work we are following, is of dilligently searching out and bringing into cultivation, for trial, the promising new fruits of home origin. We have plenty of material to work with and the result in the end will be success. A few years ago a cross was made at Ames, Iowa, a blossom on a De Soto tree was fertilized with pollen from one of the Japan plums, the result of this cross was named Japan Hybrid No. 2. These trees have been fruiting on our grounds and I consider them for all purposes far ahead of anything in the plum line yet known. The tree is as hardy as the De Soto and the fruit is good, fair size, and in quality it is only equaled by the best types of Domestica. In many parts of the state this work of cross-breeding is being carried on by experienced persons and all sorts of crosses are being made with different varieties of fruit the result of which I believe will in the near future be worth millions of dollars to the people of Iowa. The one cross I have referred to is of exceeding great value.

Mr. C. G. Patten said a few years ago, "Another feature of our experiment that is very encouraging is the fact that a large majority of our American apples are producing trees that are more hardy than the parent, and bearing apples of larger size. Some of the many cross-fertilized seedlings show marked peculiarities in tree, and from what we have already seen we confidently look for very interesting and valuable results."

This society recognizes the fact that a knowledge of horticulture is far from being co-extensive with the practice of the art, and a truly satisfactory degree of success is only occasionally attained. A rich soil and a genial climate conspire to render the rudest and most empirical cultivation under

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favorable circumstances, moderately productive. Plodding industry, however blindly applied, is looked upon with favor by all-loving nature; but her richests gifts are reserved for united science and skill. As in every other department of human effort, "knowledge is power." To increase and extend a knowledge of the theory and practice of horticulture is the object of this society.

"Happy indeed is he
Who lives upon the natal soil he loves,
And sits beneath his old ancestral groves."

But this happiness, says a good author, "is the lot of comparatively few in this country. Our forefathers were too deeply absorbed in the work of hewing down forests to think of planting groves, or to appreciate their beauty. They waged a war of extermination against trees, and so far as they went, nothing but blackened stumps and unsightly skeletons remained. The effects of their indiscriminate "clearing" have been partially remedied in the older portion of the country; but even there the language of the motto applies to only a few. Each man's natal soil is in the hand of a stranger. What American lives where his father and grandfather lived and died? We have been a migratory people. It will not always be so, however, and if we can not, except in rare cases, "sit beneath our old ancestral groves," we may yet sit beneath those of our own planting. We may learn to "Love our own contemporary trees," and die with the hope that our children and grandchildren may enjoy their shade after we have ceased to need it.

I wish to call the attention of this society to a subject, that as yet but very little attention has been paid. I refer to nut culture. The American Fruit Culturist says: "The introduction of Japanese varieties of chestnuts and walnuts has created an interest in the growth of our native nuts, too long delayed, which will unquestionably contribute much to pleasurable and profitable cultivation of land."

It is not at all so easy a matter to raise any of our native nuts as it is the soft fruits. Unless nursery grown, and that properly too, they are all intolerant of removal, and grafting is too commonly a failure; besides this, they do not come into bearing, excepting in the southern states, until of considerable age.

Notwithstanding the inherent and persistent character of some of these drawbacks, the results to be obtained fully justify the necessary care and skill which in a measure will overcome them.

While the extraordinary size and appearance of nuts, as in soft fruit, will always have a favorable influence in their sale, it should not be overlooked that it is often the case that small nuts may have proportionately larger meats and be of sweeter and higher flavor than large ones. Each variety should be judged upon its individual merit.

Wherever there is a tree which produces nuts which possess apparent superiority over others the owner should bring specimens, with the fullest description of the tree, its probable age, location and peculiarities and exhibit them to the society while in session.

This session will bring to a close my second term as president of this society. I thank you for the honor confered upon me and hope my successor will have as pleasant and agreeable duties to perform and that everything

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will be as harmonious and agreeable in the future as it has been during the time that I have had the pleasure to preside over your deliberations.

W. H. GUILFORD: Our president has spoken of the Japan Hybrid plum No. 2. I heartily recommend it as being desirable, the tree is hardy and an abundant bearer. It is a free stone and the fruit is excellent for preserving. I have 250 seedlings from this plum that are free from the pollen of any other variety. From some of these I hope to get a plum equal in quality to the De Soto and in size equal to the Japanese.

J. S. TRIGG: Will Mr. Guilford state the principal object sought in crossing the varieties.

W. H. GUILFORD: To increase the size of the fruit is one thing, but the chief object is rather to increase the quality and flavor of the plum.

C. F. GARDNER: When I say that the Japan Hybrid referred to is equal in quality to the Domestica plum, I mean that it is a positive fact. The De Soto plum does not equal the Domestica plum in quality.

J. S. TRIGG: If any of you have sampled the Burbank plum you will pronounce it superb, and that is a tame plum. Has any of that peculiar flavor been imparted to the Japan plum spoken of by Mr. Guilford and Mr. Gardner.

W. H. GUILFORD: I have not been able to detect that particular flavor in it but I have seen none other equal the No. 2 in its pleasing qualities.

C. F. GARDNER: It has a peculiar taste of its own, unlike that of any other sort.

ELMER REEVES: When a cross has been made between two distinct varieties and you attempt to follow up the crossing the tendency is to run into sports, but in some one of the many seedlings themselves you may obtain in size and quality something superior to the first seedling or cross.

G. A. IVINS: Has any one fruited the Ironclad plum? From various parts of the country it is recommended highly. It is about the season of the Miner in ripening.

WESLEY GREENE: I think I have some fruit at the state house, but am not favorably impressed with it thus far.

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REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Your committee heartily and unanimously approve all the suggestions contained in our President's address, and especially commend the recommendations favoring the better propagation of our native nuts and the more persistent and intelligent cross-fertilization and selection of all varieties of our cultivated and native fruits.

W. A. BURNAP,
L. B. DUMBOLTON,
L. A. CLEMONS,
Committee.

HOW TO SUPPLY A FAMILY WITH FRUIT FROM A TOWN LOT.

BY J. S. TRIGG, ROCKFORD.

Hundreds and thousands of families having from ten to twelve square rods of ground in town lots, and which is made to produce only a little lettuce, a few beans and tomatoes, might from the same ground, supply the family with fruit during the entire season. I do not pretend to say that one can raise all kinds of fruit on such a lot, but I will name a few things which can be successfully grown, and which will go farther toward supplying the table and add greatly to the health and enjoyment of the household. First, let us have a few hills of pie-plant. Canned pie-plant, when cut early, while the stems are tender, affords a delicate winter luxury. Next, let us set out six Victoria red currants, six White Grape currants; six Older raspberries and six Columbia; around the edge of the lot on the south side, and close to the fence plant six grape vines, two Moore's Early, two Worden, two Niagara, and if I should add just two more it would be the Brighton; these to be trained on the fence or on the side of the barn or other outhouse, and you will be surprised to see what they will produce. Two square rods of strawberries as they can be grown will give a family all they can use. The method of planting and subsequent care has already been described. On the outside of the lot, instead of maple and elm trees, substitute fruit trees. The cherry tree is beautiful when in bloom, and while fruiting more so. Put from two to six plum trees on the lawn instead of shade trees. This is a good list: One each of Wyant, De Soto, Rockford and Hawkeye. As soon as they are six years old they will supply a family with all the fresh fruit of this kind they can possibly use and leave some to can. If there should be room left for one-half dozen apple trees, plant for home use; one Duchess, one Whitney No. 20, two Wealthy, one Longfield. The winter

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apples may be purchased from your grocer. Now this that I have mentioned may be reasonably accomplished on an ordinary town lot. If desired an asparagus bed can be added in some corner of the lot. As to the varieties of cherries to plant, I will name the Wragg, as it is sure to bear, one Ostheim, of Russian origin and of good quality.

ELMER REEVES: The Wragg cherry is the principal variety upon which we can depend for a crop the country over, and of sufficient good quality to make is desirable. It is the best we can grow and be sure to succeed with.

W. GREENE: Cherry trees that have not been satisfactory in fruiting should be top-worked with some other variety.

C. G. PATTEN: I would suggest about the first of March as a favorable time to do the grafting.

ELMER REEVES: Mr. Trigg has given us a list of fruit for a town lot, and it is supposed that it is to receive intensive cultivation. How would he vary the condition of the farmer?

J. S. TRIGG: On the farm I would recommend about the same varieties planted in rows where there is plenty of room, to be cultivated with a horse cultivator, and this can be done with little labor and expense.

W. H. GUILFORD: If Mr. Trigg had advised planting the entire lot to asparagus and then sell the product, could not one buy with the proceeds, more than could be produced on the lot?

J. S. TRIGG: If that were true, which I doubt, money is not the only consideration; the pleasure of growing the fruit and having it fresh on our own table is a far greater consideration.

PRACTICAL THOUGHTS SUGGESTED BY THE EXPERIENCES OF 1900.

BY G. H. VAN HOUTEN, LENOX.

Each year brings new experiences and doubtless each year but adds emphasis to the experiences of former years. Each person should decide for himself as to what can be gained by the experience of the year and the accumulated experiences of the years, and unless he is willing to do this it is doubtful if he would profit by the suggestions of others, however beneficial or pertinent they may be.

The great loss of summer and fall fruit and even early winter fruit must impress itself on all thoughtful persons. How this is to be avoided is one of the problems that the future must solve. It is certain that the markets cannot take or use all of this fruit in the usual or old way and it behooves the grower to study the problem with a view of utilizing it to better advantage than in the past. The old way was to make this fruit up into cider, but

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experience has demonstrated that, with the exception of a few places, that this will not pay. Some have established apple butter factories and in this way have used to advantage the surplus fruit. If the work is well done and the product put up in neat packages and properly handled there is a prospect of a paying business and a growing trade in the line of fruit butters. It must be kept in mind, however, that to establish and hold a trade that good articles must be put up and the neater the packages and the more portable and compact, the greater prospect there will be in finding ready sale and popularizing the goods. During the time that the American troops were in camp at San Francisco it was my privilege to frequently visit the hospitals and I there learned that the fruit prescribed for the soldiers who were sick was not the canned fruits of commerce, but that put up in glass, and in making frequent purchases found out that the price was very much higher than the price of good fruits put up in tin. This led to some inquiry and I found out that many families in selecting fruits always bought fruit in glass. Investigation as to price and relative cost convinced me that there was a considerable margin of profit for the fruit put up in glass over that put up in tin, on account of the much higher price. There was one thing in regard to the fruit put up in glass that perhaps increased its sale and that was that an inspection of the fruit could be had and thus a real good quality would favorably impress itself upon the purchaser, while that in cans of tin had to be sold on the recommend of the merchant, or taken on the faith in the brand.

It may be possible that in the small towns that but a small trade of this kind could be worked up, but even a small beginning might prove the advantage of the plan and as there is a constantly increasing demand for prime articles, and as there is a constantly increasing number who are ready and willing to pay good prices for prime goods it is worth the while of any grower who is situated so that he can test this to make the effort to utilize the surplus fruits in this way.

Better means of preservations should be found. Nothing is more discouraging than to have a great lot of fruit rotting in a cellar. Outside caves and storing in out-houses or under straw until severe weather is much better than to put a great lot of fruit into a cellar. Caves can be made at small cost and if there is a good deal of fruit, several caves will be found to be a good investment. It is hardly probable that we will ever be able to impress the importance of but few varieties, and they of the most profitable kinds, but until that impression is made there is a great demand for some kind of storage that will enable the grower and merchant to handle many varieties together. Crates, bins and boxes or barrels will, in a measure, overcome the disadvantages of handling a large number of varieties, but all should be so arranged that any variety may be reached without moving the others. It often happens that a certain variety that is noted for long keeping will not keep well, and on the other hand some not noted as keepers will keep beyond the expected time, but it is safe to assume that most varieties do not keep as well as formerly, especially when many varieties and large quantities are kept, for decay induces decay and if one kind begins to rot other varieties become effected and in this way damage results to the long keepers when, if stored alone there would be little loss.

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Each year but gives more emphasis to the thought that those varieties that do well that year become favorites with the masses, regardless of former behavior. A variety of fruit should be considered as an individual and if the reputation is bad, all promises should be taken with reserve. On the other hand a single failure should not deter one from planting a variety that has given good satisfaction in the past.

The great number of people who have been swindled during the present year by traveling tree salesmen convinces me that the "fool killer" has not completed his work. I shall not recommend that your society appoint deputies to aid him in his work, but really must confess to a feeling of discouragement that after all we have done to protect the people from frauds that they are still being swindled. Not that we should expect that all of the swindling should be stopped, but that the old frauds of "French crab stocks," "whole root grafting," "budding" and the dozens of old tricks should still induce people to buy, when they have been exposed time and time again, leads one to wonder how long it will take to put the people on their guard, so that they will not be imposed on by the transparent frauds. We should, however, console ourselves that if some are swindled that many others are warned and protected by the work of our societies, and in this thought we should take courage and persevere.

The object lessons of practical home adornment are observable and the good work should go on. There is such a noticable improvement of farm and village homes in the way of lawn making, tree and shrub planting and general tidying up that it must please those of our members who have been urging reforms along this line. There is room for still further advancement along these lines. In many towns and cities there are societies formed for this purpose, and right well they are performing their work. Some of these societies go further than mere decorations and urge improvement along social and educational lines and while paying especial attention to the theoretical part they are not losing sight of the practical part of the work and they urge road improvement. This, I consider, a very important part, for no place can advance to the proper plane of advancement with bad roads. No one should be content so long as a bad road continues along his land or in his neighborhood, township, county or state. The onward march or progress demands, most imperatively, that there shall be improvement along all lines, moral, social and material, and I will go even farther than this and insist that even religious advancement should be made and insisted upon. I notice in your program that you open your sessions with an invocation, which is quite right and proper and if so, then there is ground for belief that more than mere formal attention should be paid to this part of the religious work for the general advancement of the individual members.

But the writer was appointed to suggest thoughts and not to preach a sermon or deliver lectures and must confine himself to the idea presented in the caption of the subject. So, in closing, will say that in whatever there is need for amendment horticulturists should make amends. They are an observing class, guided by high motives and noble aspirations and if they do as well as they know how will do well.

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DESIRABLE FLOWERING PLANTS AND SHRUBS.

BY EUGENE SECOR, FOREST CITY.

It is not my purpose to enlarge this paper to the extent of treating all the pretty and desirable things which the lovers of flowers might plant with satisfaction. The list would be a long one and my experience is too limited to undertake the job. I presume the secretary, in assigning this topic, wished me to treat of a few kinds which had come within the range of my experience or observation. Possibly he thought that some of the old and tried sorts needed to be brought to the attention of the younger generation and their value restated.

I am not one of those who think that because a flower or fruit is foreign or new it is therefore to be praised and advertised. Nor on the other hand is it to be condemned for the same reason. But for the average planter—one who does not care to experiment—it is safe to steer clear of novelties at high prices, and begin with the tried and tested, even if old fashioned sorts, which, like old friends, can be depended on.

Among the desirable shrubs that should be in every yard is the Pæony, which, like a patch of asparagus, once planted is a joy for a generation. No lover of flowers can afford to neglect it. But it's a great home-body and doesn't like to be torn up by the roots to accompany some roving family that moves every year. It's a gormand, too, as well as a stay-at-home. Good living and kind treatment will bring out its good qualities. There are a good many varieties, but I presume not all of them are equally desirable.

I know a man who claims to have 170 distinct varieties in bloom.

It is best for the beginner, however, to stick to the well know and widely disseminated sorts until he is rich enough to afford a larger assortment. Fall is the best time to plant or remove the roots.

A bed of tulips is one of the easiest things to possess and will repay the planter every time. I like the single ones best. They have better stems and quite as much beauty, but a bed of mixed ones, single and double, is desirable. Unlike the pæony, you can dig the tulips up every fall, or once in two years, and replant to advantage.

Gladiolus: This is a showy flower for late summer when many others are past their season. The bulbs should be dug in the fall before freezing and stored in a dry, warm place, and planted each spring, three to four inches deep, in rich, mellow soil. So many beautiful colors have been produced that a bed or row of this exquisite bloomer ought to be in every flower garden.

But for a modest little bulbous flowering plant whose charm exceeds its size, name me the Lily of the Valley. Sweet as the dripping nectar from a clover field is the perfume of this delicate, inconspicuous but valued member of the perennial group.

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One needs, though, not merely a specimen of it, but a bed large enough to pick a handful of blossoms at a time. Then it is we recognize its beauty and its charm. A partly shaded spot is suitable for this flower. I have seen it taking care of itself among the unmowed grass, showing that little attention is needed after it gets established.

A bed of pansies is almost as necessary to the modern flower garden as a carpet on the parlor floor. It is a prime favorite with all classes and needs not to be urged upon the attention of anyone.

The same may be said of the sweet pea. These two popular flowers are seen and loved everywhere, and are the harbingers and promoters of a growing taste for the beautiful.

Perennial phlox needs only an invitation and a little corner, to add its wealth of annual bloom. No care is required but to plant. It will take care of itself like a bed of tansey. It makes a good border.

The rose, queen of all the flowers, is universally loved, but is not always a success on the prairie. In the cold northwest it ought to be understood that protection in winter is just as essential in rose culture as a stable is desirable for the cow. Both may live without, but at the expense of vitality and usefulness.

As to the different varieties, there need be no "Wars of the Roses" as when the House of York, with a white rose for a badge, fought the House of Lancaster with a red rose for thirty years in the olden time, for the red and the white will bloom side by side, the pink and maroon flourish in the same row, and the blush color and the yellow may grow in queenly beauty along the same garden path, if only we do not forget the covering in winter and generous treatment in summer.

Of course the lilacs, the common purple, the white and the Persian, all as hardy as hazle brush, should be found in every yard. I have the white top-grafted on the common purple, which makes a pleasing combination on the same bush.

The old fashioned snow-ball is both showy and hardy, and, blossoming as it does in my locality about Memorial Day, is much sought after for decorative purposes. If given room and sun the profusion of bloom is astonishing.

The tree cranberry, a native in Iowa, belonging to the same species, bearing a beautiful fruit, is worthy of more extended cultivation as an ornamental.

Russian Snow-ball (*Viburnum lantana*). This is an interesting relative ot our common haw, but very much finer for ornamental purposes. Its leaf is very thick, almost leathery. The buds for spring blossoms are prominent in the fall and one might fear they would be injured by severe winter weather, but it is as hardy as the common snow-ball. While the flower is not so conspicuous as the latter, being formed like haw and tree-cranberry, it blossoms earlier and its clusters of red berries hang on a long time. I regard it as a valuable addition to our list of hardy shrubs.

One of my earliest recollections is of a large clump of syringa, or mock orange, which stood in my father's back yard. Its perfume filled the whole place for days.

I am happy to say that the object of this early love has never forsaken me nor I it, and that it blossoms as profusely and smells as sweetly on the virgin soil of the west as in my boyhood home among the hills of New York.

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The syringa deserves a place at every home. There are two varieties with which I am acquainted—one very fragrant, and the other more showy but with less perfume.

Another shrub of about the same general utility as the syringa is the tree-honeysuckle. The white and the pink varieties are both desirable. There may be others, but I am acquainted with these only. They are so easily propagated, so hardy and so satisfactory in every way I wonder why they are not more common.

Buffalo berry ought to be better known and more generally planted than it is. It is adapted to our climate and is ornamental in appearance. The silvery expression of its foilage throughout the season makes it a very interesting addition to our list. But if fruit is wanted, it must be remembered that the flowers are diecious, viz., one sexed, and therefore staminate and pistilate-bearing bushes need to be intermingled in planting. But just how to tell the sex of the plant when young, I don't know.

Dwarf June-berry is another semi-useful bush that might well be used for ornamental planting. The flowers are very showy, and if one never got up early enough in the morning to get the fruit ahead of the birds, a clump of the bushes would be desirable.

Berbery: Several varieties of this fine ornamental are worthy of cultivation. It makes a nice low hedge or border.

Tamarix Amurensis. Although the European variety is advertised by eastern nurserymen it is seldom seen in the west, and perhaps would not succeed here. This Asiatic, however, deserves a place in every amatuer collection. While it is not quite as hardy as we could wish, it is sufficiently so to warrant planting, even in northern Iowa. Its spray-like branches and its delicate, pinkish, panicled flowers make it an object of interest to every passer by.

But lack of time and space forbids me to mention all the fine things adapted to our conditions. Spireas, (several sorts) Weigelia, clematis, especially the Jackmani which is very showy, hardy hydrangea, hollyhock, canna, dahlia, besides dozens of others both perennial and annual, await the careful cultivator to coax them into being and persuade them to do their best.

W. H. GUILFORD: Have any of you tried Spirea Van Houtii as a hedge? I have used it for this purpose, and it is beautiful.

C. G. PATTEN: The shrub just mentioned is one of the very finest that we have and is very hardy.

J. S. TRIGG: Mr. Secor did not mention the tea roses. I know of nothing nicer, and they are usually free from bugs. It is possible to have a boquet of such beauties on the table every day during the summer. They may be taken up late in the season, put in pots and placed in the cellar and kept moist, thus preserving them through the winter season. Out of doors they should be planted where they will be shaded during the latter part of the day.

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C. G. PATTEN: Tender vines as well as roses may be protected during the winter season by laying them down close on the ground, then place boards on either side of the plant resting on the edges, the upper edges coming together at the top, thus forming a trough shaped protection which can be more completely covered with any kind of mulch. I am informed that a man in the southeastern part of the state raises the tender varieties of California grapes by this method.

J. L. HERBST: I do not know as I have much to report on outside of what I have already given you. Our state society is in a thriving condition. From a canvass of our members I find that we have one hundred and sixty-one varieties of apples growing in our state. Duchess heads the list, followed by those in order named: Wealthy, Northwestern Greening, McMahon, Yellow Transparent, Tallman Sweet, Fameuse, Wolf River, Tetofsky, and Longfield. Forty-five varieties of plums are being grown including De Soto, Hawkeye, Rollingstone, Wyant, Abundance, Cheney, Wolf, Lombard and Forest Garden. Eighteen varieties of cherries were found; twenty-five grapes; sixteen currants; eleven gooseberries; eleven blackberries; fourteen black raspberries; twelve red raspberries; forty-nine strawberries. The above does not include those grown in the Wisconsin state experiment station. Variety is the spice of life and I guess we have it.

Our state publishes its magazine monthly and contains many articles by practical growers on the culture of fruits, flowers and plants.

Our annual winter meeting will be held at Oshkosh, January 14th–17th, in connection with the State Poultry Association. We expect a very pleasant and profitable session. We have offered some liberal premiums and the prospect for a big exhibit of apples is very bright. We have also offered some liberal premiums for the best essays on care of apple orchard, raspberry, blackberry, strawberry, grapes and flowering plants and shrubs. The prize essays will be read at the winter meeting and some lively discussions will no doubt follow.

We should be glad to see some of you at our winter meeting, and I assure you the same hearty welcome which you have accorded me.

L. A. CLEMONS: I wish to ask Mr. Herbst what he knows of the Eldorado blackberry?

J. L. HERBST: It has been fruited in certain localities in Wisconsin with some success. I may add to the report already

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made that in general, we raise strawberries in about the same way as has been described in Mr. Irvins' paper. About three-fourths of our berries are Bederwood and Warfield. We raise Bederwood, Splendid and Mitchell's Early for fertilizing, also use Van Deman for that purpose. We fruit our beds three years in succession. We have separate propagating beds that we use and sell plants from. We use as high as forty loads of manure to the acre for preparing the beds. Use straw for covering. We market our fruit at nearly all principal cities in the West. There are about four hundred acres of fruit cultivated in and around Sparta. Eighty-five cents for a sixteen quart crate of friut is usually a satisfactory price for the berries. Nemaha is the favorite among raspberries. It stands the climate better than the Kansas and ships better than the reds, and is the most profitable berry we can raise. We cover all our raspberries and blackberries with earth for protection during the winter.

E. F. PECK: Staple's strawberry, a seedling of the Warfield, will fertilize the latter and is equal to it in yield of fruit, being much the same in color and sells well.

C. G. PATTEN: In discussing the subject of raspberries we must take into consideration the locality from which the speaker comes. At my place it is a waste of time to plant the Marlboro, but as you go north of Minnesota and even at Sparta, they succeed much better. So these things must be taken into account.

WEDNESDAY EVENING.

"How to increase the permanent membership of our society," was a qnestion that elicited much attention and was quite fully discussed by W. A. Burnap, C. G. Patten, Elmer Reeves and others.

PLANT BREEDING.

BY A. T. ERWIN, AMES.

I recently met a group of people who were having quite a discussion over the question as to "What is a weed?" One answered, any wild plant which has no beauty. But, spoke up a Bohemian, "over in my country, the pansy which you regard as beautiful, is one of our worst weeds of the field.

The point that I wish to bring out, is this: All cultivated plants have a native home somewhere—some place where they grow wild and may

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even be weeds. In many of them great changes have been brought about through the agency of man. Briefly, these changes have been brought about in two ways, breeding and selection. Through breeding we may form a union of two dissimilar individuals and obtain an offspring combining these characters, hence, we get new variations and types. Hence, our first step in breeding must be to get a clear idea of what is wanted and then select parents which will come the nearest to yielding these desired characters. For example, in the Northwest we are badly in need of a hardy, free blooming rose. At the experiment station we have been working to create such a variety, selecting the Japanese *Rosa rugosa*, which is hardy and vigorous, but single flowered, as one parent and Gen. Jacqueminot which is free flowering, fragrant and good color, but not hardy here, as the other parent; we obtained offsprings many of which showed combined characters and some of which are promising. All these hybrids seem hardy and some of them are free blooming and even more double than is Gen. Jacqueminot. Promising results have also been obtained in crossing the American and Japanese plums. We are not at all sure of obtaining an offspring which shall obtain the desirable characters of both parents, but we are sure of variation. Some, much inferior, others, perhaps, an improvement over any existing variety. Through this variation the work of selection comes in. I believe there has been a tendency to over estimate the work of crossing. It is simply the beginning point, a means and not an end. From this variation we begin the work of selection—culling and weeding out. Hybrids are usually unstable and when we have a form of the desired character it is often difficult to retain it. When variation begins it is not inclined to stop at the point desired. This work of retaining the desired form, is known as "fixing the type." For several years this work of fixing must be carried on, until the variety becomes constant in its characters. In this fixing all characters which appear and do not belong to the ideal which we are attempting to create, must be rigidly rejected and not further propagated. Hence, the work of originating new varieties, if properly done, means a long, laborious process and some cost. However, the end to be attained more than justifies the cost and it is a work in which every fruit grower should be interested. It was Professor Bailey who expressed the idea that the "great inland empire of the Northwest must develop a pomology of its own." Certainly the most encouraging feature of your meeting here is the large number of seedling varieties exhibited and the interest manifest in this work. Perhaps few or none of these may prove of permanent value, but it is a work in the right direction and promises much for the development of horticulture.

ELMER REEVES: In the two different methods of producing new varieties, viz: from seeds and from cuttings, will Prof. Erwin explain the difference?

A. T. ERWIN: In the use of the cutting you simply extend the same variety, while by the seed process you combine a principle which tends to produce an unlike variety.

W. A. BURNAP: Another question. If a plant be self fertilized, will the seeds of its fruits perpetuate the same kind of plant?

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A. T. ERWIN: Yes.

WESLEY GREENE: That, to my mind, is not certain, but most probably there would be unlikes in the seedlings produced. A Winesap apple fertilized with winesap pollen; the resulting seed will not produce a Winesap until the type has been fixed by seedling production.

C. G. PATTEN: The reason why the De Soto plum will not produce the same kind of a tree is because generations of varieties enter into the nature of that particular sort. Plants, as well as animals, have predominating forces which will assert themselves as others will not do. It is the plant which possesses this force that is most likely to success in perpetuating itself. This type is apparent in the Gano and Ben Davis apples. They have certain constitutions fixed in the cross which almost obliterates the nature of the variety with which they are again crossed.

When I went to the American Pomological Society, I took a few specimens of Patten's Greening with me. These were compared, by experts, with plates of the Rhode Island Greening on exhibition at that meeting, and the varieties could not be distinguished one from the other. So far this season, and from the fact that the Patten Greening tree resembles the Duchess, I am led to believe that Patten's Greening is a production from a cross between those two varieties.

W. H. GUILFORD: If you plant the seeds of your Greening now it will amount to the same as the inbreeding of an animal, will it not?

C. G. PATTEN: Yes, practically so.

ARE WE DOING OUR BEST?

BY EDSON GAYLORD, NORA SPRINGS.

If not, would it not be wise to consider some of the why-nots? I have no desire to cast any reflection on any person or society, for as a rule the majority have been trying to do what they thought to be for the best interests of horticulture, but it appears that if not retrograding we are not advancing as we should, especially are we not spreading the gospel of horticulture among the masses as we should and can by adopting some other and better plan of work. This is too fast an age to be found standing still or going back. In this connection may we not learn a profitable lesson from the advance made by our ice bound neighbor on the north. Their horticultural society has now nearly a thousand members, while we, the great, wealthy and proud state of Iowa, can only boast of having somewhere in the neighborhood of four hundred. They publish over a thousand copies of a horticultural pamphlet each

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month in the year, and employ a secretary the year around to gather useful items and publish them for the immediate benefit of the masses.

Many long years ago, I used to live quite near an aged man who used to say to his boys, "In going thrugh life you will find it a wise plan to pause occasionally to look back and review the course you have been pursuing in the past;" therefore I hope to be excused if I turn back the leaves of our horticultural record for the last ten years. If I err, it will not be through any design, and I shall expect to be corrected. I find the records show the following to have been the membership of our society from 1889 to 1899 to be: 1889, 263; 1890, 340; 1891, 355; 1892, 401; 1893, 350; 1894, 472; 1895, 357; 1896, 393; 1897, 395; 1898, 436; 1899, 460. If the casual observer will examine the records he will see that the reason that we find such an excess in 1894 and 1899 over other years is simply due to individual effort, or to what might more properly be called a spasmodic horticultural effort of a certain few enthusiastic horticulturists. For instance, Mason City in 1894 had sixty-seven annual members, all of Mason City. In 1895 they dropt to one annual member only. This surplus in our state count which swelled the membership to 472 at that time was caused by this spasmodic effort at Mason City. Very much the same thing occurred at Spencer in 1899, the year previous to this year there were no members from Spencer. In 1899 there were seventy-nine annual members all of Spencer and only ten others added outside of Spencer. In case the meeting of the Northwestern society is not held at Spencer this present season it will be quite safe to say their number can be counted on the fingers of one hand and unless we have another such eruption, we shall probably drop nearly as low as we were ten years ago. Now I ask with these figures and conditions staring us in the face, is it not well to consider "where we are at". It is neither profitable nor wise to attempt to show the many causes that have kept us where we are. The causes are too numerous and complicated to admit of discussion. It is enough for us one and all, who have the true cause of horticulture at heart to see and know, that when we take into full account our past experience, our accumulated knowledge, our will and abilities, and place these along side of the little we have accomplished through our present plan of work, that we as a society of horticulturists "have been weighed in the balance and found wanting". From this I would say at once to one and all who have the true interests of horticulture at heart that we will join hands and make a decided effort to extricate our cause from the ruts. To this end I would beg leave to make a few brief suggestions; not that I think I can do this better than many others but because no one else appears to make any move in this direction, to wake or lift us out of our lethargy. If nothing better can be done let us devise some plan of action at least sufficient to place us along side of the state of Minnesota. What is the reason that our neighbor has left us so far behind in the cause of horticulture? Has she richer fields, broader acres, more intelligent men and women? Echo answers no. Yet we cannot deny that she does possess something we do not. It must be energy and grit. Grit means will, and will means a way.

My plan to head Minnesora and the rest of the world, generally, is about as follows: Others, no doubt, may be able to show better ways, if so I shall be one of the first to follow. I have been very much impressed with a plan like this: Give it into the hands of the voters to elect one representative from

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each congressional district to meet annually for a week or ten days to examine all such articles as now make up our annual report, and that it be their duty to arrange and publish all articles suitable for said report, with the aid of a secretary who may be appointed by this board, or if found more expedient, let them employ some one thoroughly versed in horticulture whose duty it should be to edit a weekly or semi-monthly paper, and either send it out free or at cost. Let it be the duty of this board, and especially of the secretary, to carefully examine all articles sent them to go into the annual report, or to be published in the paper; wherever any item is found which is deemed erroneous, they, or the editor, shall suggest and attach notes such as will help guard against any errors in connection with the articles when published. The importance of such corrections we all have seen. By this plan all can readily see both sides, and then follow that which appears best to them. It shall further be their imperative duty to secure knowledge, as far as possible, of all scheming, tricky tree dealers, or venders of any kind of horticultural stock. As soon as informed of any false dealings in any locality in the state, if from the evidence furnished him, he thinks it advisable, let him send out as many circulars as the occasion appears to warrant, to the postoffice nearest the place where such deception or fraud is being perpetrated, and the postmaster be instructed to hand them out free of cost.

Let the secretary and editor receive a reasonable salary, and let them be sworn not to be pecuniarly interested, directly or indirectly, in the sale of any kind of horticultural stock or goods. Let it be his duty further to criticize in his columns all errors pertaining to horticulture that may come to his notice, and to make it a point to publish the most valuable articles which appear in other horticultural and farm papers. To illustrate the need of such a plan I will refer to one or two instances. We often see in farm and horticultural papers such erroneous advice as the following: Set apple trees an inch or two lower than grown in nursery. Whereas they should be set from seven to fourteen inches deeper, except in low and heavy soil. Again they say, use tarred paper to protect trees. Thousands of trees have been killed from following this advise, also they say set apple trees down to an angle of 45°, better not lean at all then at this angle. Others tell us to head in or clip off the shoots growing out on the northeast side so as to force the tree to build up the sunny side. This advise only adds fuel to fire, as every limb or twig cut off will at once put out two in its place. Again we read in late standard works that butternut and hackberry trees are deep rooted. Many of these mistakes may be the result of careless proof reading, but this does not avoid the evil done by the circulation of these errors uncorrected. I have read in the last few months the advice of three or four good writers to set trees leaning to the southwest, by this plan nine out of ten would be set leaning as far as the three o'clock and the majority would be more likely to set them as far as the four o'clock sun. They might almost as well set trees to the northwest as to the southwest, there is only a slight difference in the result. It is not necessary to name the authors of these articles as it is not men I am aiming at, but to show the need for a secretary such as I have suggested.

As a society and individually we have been far to backward in correcting such errors when we have seen them going the rounds, knowing as we do the world of evil they must work when read by those of little experience,

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who see and know no other way than to follow almost anything seen in print. It is a well established fact that the editors of our horticultural as well as farm papers seldom make any effort to correct what they know, or ought to know, is likely to bring an untold amount of harm and disappointment to those who read. One bad error is more powerful for harm than a score of good points are to promote good. These errors are not always left unrebuked through ignorance as is known by personal experience. In two cases, I have called the attention of editors to certain frauds which were being palmed off on the gullible public. My cumminications not being published I have sought the cause and found by searching the advertising columns that in each case the parties referred to had a finely written advertisement in the same paper. There is an old saying, that there is one kind of a dog that cannot be made to fight another kind of a dog. I wish to cite another instance on another line of policy which seems to me to be one cause of our lack of advancement, and of the decline in the interest taken by a number of our best members. I refer to action taken by our society at Mason City, Osage and other places. At Osage it was decreed that summer apples might be kept in cold storage or by any other method and be entered for all annual prizes. The awarding committee, both at Mason City and Osage and elsewhere were instructed to give little if any credit to those varieties which were on the wane on account of supposed lack of hardiness, notwithstanding all these old and choice varieties had been successfully grown by a number of individuals on orchard sites grading down as low as 4 and 5 and had passed through the terrible ordeal of '85 and came out unharmed, many bearing before and all afterwards. The reasons there shown being caused by the use of a plan of top-working onto hardy stock. It is hardly strange that those who had devoted so much time and effort with such wonderful success should have become discouraged and dropped out when they saw Russians and worthless seedlings preferred. I am inclined to believe the truth of the old adage that "an honest confession is good for the soul," and I trust that the suggestions I have ventured in this paper may not be entirely without benefit to the cause *we love*.

This season within about seven miles of our depot has been collected near or quite $1,000 hard earned cash, for that which I would not take as a gift; this has come mostly from the sale of budded trees. Now I wish to refer our home nurserymen to this deal of which by all reason and rights belonged to them. From this let us estimate the annual loss to the whole state. If this has been done just in one small locality and in the immediate neighborhood of such well informed men as Edwin R. Heisz, M. H. Nickerson, and others, what may we not expect taking the state over. It appears to me that $100,000 would not cover the first cost and that two nor three times this amount could not make good the future loss. When we think of this, we can but be astonished at the vast amount being annually worse than thrown in the fire. For forty years this same thing has been going on, and up to date we have had no remedy. Need it any longer be a wonder why our honest nurserymen are being driven from the field. I for one see no remedy except through some radical change. Today as I was mailing my article for your meeting I met one of our best farmers and said: Did you buy any nursery stock of those chaps who canvassed this locality this season? He replied that he bought 100 trees. Said I, on worthless

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roots? Why no, said he, every tree had large heavy roots; whole rooted trees, fine roots as you ever saw, said he. I invited him to call at my place and I would show him an object lesson that would have saved enough to pay for the Fruitman or some other reliable paper till he was too old to read. I met these humbugging men and women almost every day but knew little as to what they were doing until delivering their stock. They called at my place to make inquiries, but never made an effort to get me to make out a bill. Now I believe that with a live, rattling editor to act as both secretary and editor, who would be constantly on the lookout, ready at the first notice of suspicious dealings to turn on his search lights in any and all directions, send out circulars to any place thought best they would save to the citizens of Iowa, ten times, if not one hundred times, more than cost. It would be impossible for any such parties to live under such conditions. But one says, you would never be able to detect such scheming till to late if at all. To do away with such doubts I would suggest that the state offer a small bounty to any person who may inform the editor of any fraudulant dealers who may be canvassing in any neighborhood in the state. This plan in full force would soon rid the state; in short, very few, if any, would dare venture to start out deceiving the people. They would scarcely dry up and burn like corn under the blast of a desert wind. This plan could not but prove a God send to all our honest home nurserymen. We have all seen the falicy of shutting down on the host of strangers who are annually found preambulating and ramifying in every direction and in almost every neighborhood. There are very many things that could be brought to bear favoring this or some radical change. All honest nurserymen need this change and the masses are ready to rise up and demand it.

HARDY PLANTS FOR BUSY PEOPLE.

BY MRS. W. L. WHINNERY, IOWA FALLS.

Nature has provided an abundance of beautiful flowers, and from the equator to the Polar regions the earth is made fair and lovely with gorgeous bloom and stately forest.

In the country where the prairies have have been broken or the forests hewn down the beautiful wild flowers have been replaced by the useful grains and fruits, or noxious weeds. There are great stretches of road through this prosperous land of ours, that are bordered with high weeds or worm riddled willows, though each year we see many improvements. Every neat door-yard and bright garden rests and refines those who pass and wields its silent influence for good.

Annuals, tender plants and bulbs are very showy and satisfactory, but require much more care and time than many farmers or their wives can give them. Of course, the hardy perennials, shrubs and roses I shall mention need some care, although a few will live and multiply in spite of neglect.

By a judicious choice one may have a grand succession of bloom from early spring until killing frosts in the fall. Early flowering bulbs are the first. Tulips and Iris, with their gorgeous colorings, take little care after being planted in September or October. They multiply from year to year,

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and from a small beginning one can soon have a large bed of them. Lilium Candidum, with its cluster of white trumpets and delicious fragrance, require little more care than a good covering during the winter. Among the perennial, the Pæony and Bleeding-heart are among the first to bloom, and are old standbys. The gay Hollyhock, hardy Phlox, Larkspur, Columbine and more delicate Achelia and Gypsophila give such an abundance of bloom that no lovers of flowers would begrudge them the little care they occupy. No plant gives more satisfaction for the care it requires than Rudbeckia—Golden Glow. After planting in the spring it grows rapidly and bears abundantly from July until well into September.

Every garden or lawn large enough, should contain at least a few shrubs and roses. The Lilac, Syringa, or Mock Orange, Japan Quince with its scarlet blossoms, the Snowball and Hardy Hydrangea give one variety. The "Mayday" is a small tree from eastern Europe, which bears a profusion of white racemes, and afterward ripens its fruit for our feathered songsters.

My favorite among all hardy plants is the rose. I prefer a few choice hybrid perpetuals grown on their own roots to any number of budded ones, as the bud is so apt to become injured, and then all one has left is a worthless briar. The La Reine and Jacqueminot are among the finest and most reliable, though there are many others from which to choose. Climbing roses and hardy vines can be used to advantage in covering unsightly fences and outbuildings.

There is a wide range among the climbers, from the delicate lacy foliage and flowers of the Allegheny vine to Honeysuckle, Wisteria, Clematis, Trumpet Creeper, Woodbine and Virginia Creeper.

It is said that living may be easier if a little beauty is added to the old ideas of utility, and it is our duty to make life as comfortable as possible, Every innocent enjoyment is a positive gain, and we should all do what we can to give pleasure and add beauty to the world.

COLD STORAGE FOR FRUIT.

BY PROF. J. L. BUDD, AMES.

The topic assigned me by your able secretary reads, "What may we expect from the cold storage system in the way of profitable keeping for later marketing our late summer, fall, and early winter apples of the north."

History and Cost.—The modern evolution and improvement of cold storage rooms have been rapid. The use of ice for lowering temperature is by no means new and the invention of plans for the making of ice in warm climates led to the application of compressed gases, and the volatization of ammonia and other liquids, for the cooling of storage rooms. The best modern plan yet known for cooling fruit storage rooms is the simple one of forcing a circulation of very cold salt water through pipes at the sides of the room or rooms. The salt water in the vat in which the forcing pump is placed is cooled below the freezing point by the ammonia vapor forced into it by the compressor. If the pump and compressor are run by a modern gasoline engine the expense of running a neighborhood plant is quite moderate. As to the cost of building and fixtures, if only two stories in height and the

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insulation is affected by brick and coal cinders, and the sizes of vats, pumps, compressors, etc., are selected for room cooling alone, and not for ice making, the expense is smaller than is usually suspected. Plants costing from three to four thousand dollars, if properly divided, will give unexpected facilities for neighborhood storing of fruits, butter, eggs, and dressed poultry, held for later markets.

Where first introduced.—Naturally, up to the present, the ammonia and salt water plants have come first into general use in hot climates. In south California for instance butcher shops, saloons, creameries, and even groceries, use them, and artificial ice is manufactured quite as cheap as with us where secured from ponds and creeks of doubtful purity. East of the mountains the plants are numerous in the south for combined ice making and cold storage and in the north as yet their use is confined to large hotels, breweries, meat cooling rooms, and general large cold storage rooms in our cities. The particulars as to plans, sizes, prices, etc., can be secured from the manufactures in Chicago, Ill., Waynesboro, Penn., and at other points.

Preserving apples.—The recent great expositions have given much valuable information in regard to the preservation of late summer, fall, and early winter apples. At the Chicago Exposition such varieties as Fameuse, Wealthy, McIntosh Red, Wolf River, Antonovka, Zuzoff, Autumn Aport, Longfield, Patten's Greening, Anisim, and other handsome, smooth, scabless northern varieties, held up with retained color and quality in June on the hot exposition tables in a way that surprised the older fruit growers. At the Omaha Exposition this experience was repeated on a less extensive scale as Wisconsin and the north was not as well represented. But the lesson was presented more fully that it pays to wrap the fall and early winter varieties in tissue paper and store them in the cold rooms in ventilated one bushel boxes as apples are now handled in Utah, Colorado, and in nearly all parts of Europe. The large ammonia cold storage rooms on South Water street, Chicago, and in Milwaukee, also have taught us valuable lessons. Visitors in the best hotels of these cities will find on the tables in midwinter Duchess, Borovinka, Lubsk Queen, and other northern grown handsome apples in such improved condition as to texture and flavor that disputes arise among fruit experts as to their identity. If picked when hard and the seeds have about completed their brown color and placed in cold room cool and dry such varieties as Charlamoff and Lubsk Queen may be preserved for the Christmas market with improved color and flavor. But in most seasons this cannot be done in ice cooled rooms as the air is too damp. In the ammonia and salt water cooled rooms the moisture of the air is largely condensed and even frozen on the very cold circulating iron pipes. Yet the air is not so dry as to shrivel early or late varieties.

Future of handsome, scabless apples.—At the Iowa State Fair in early September of 1900 over one hundred varieties of handsome, smooth, scabless varieties of apples were found in the north Iowa exhibits. At the Minnesota State Fair, still a greater number of handsome varieties were shown most of them fall or early winter in season. At the county fairs over north Iowa and in Minnesota and the Dakotas tables in like manner were loaded with smoother and handsomer varieties than the past season could be shown in southwest Iowa or Kansas. Many of these if grown commercially and handled methodically in cold storage will prove more salable than such

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southern varieties known as late keepers such as Willow, Stark, Ben Davis, and Missouri Keeper, that lack the tenderness of flesh, juicyness and flavor of the earlier maturing varieties ripened in cold storage.

Saving the refuse apples.—As the years go on at the north the neighborhood that grows apples commercially will not only be able to construct and use a cold storage plant but ways and means will be found to save the fruit that would go to waste by drying, jelly making, vinegar making and not least sweet cider making—kept sweet in cold storage until midwinter.

CHERRIES—VARIETIES AND CULTIVATION.

BY W. H. GUILFORD, DUBUQUE.

The cherry is the first of our tree fruit and holds a place in the north temperate zone second only to the apple. In most of European countries it is both food and drink. Its healthful, refreshing qualities are so much appreciated that in most of the older countries it has legal rights on the roadside. The selection and adaptability of varieties have been studied for hundreds of years. In Germany it is not unusual to find the adaptability of a certain kind confined to a few hundred square miles or less. The selection of stocks and propagation is to them a matter of great importance. In Switzerland it is not unusual to find the children gathering fruit from trees planted by grandfathers of a past generation. There is a vast amount of ceremony, advice and conservative preparation in planting a cherry tree. The blowing down or premature death of a tree is a family calamity. A gentleman on his return from his boyhood home in the Eagle Nest (Switzerland), brought me a handful of cherry pits, saying to me, "Grow these up to trees for me; if I don't live to eat the fruit the children will and remember and love the boyhood home of their father." Are we building for the trees that will be associated with the memories of childhood in years to come? But climatic conditions seems to tell us that the old cherry tree is not in the immediate future; at best, fifteen to twenty-five years is the life of our cherries.

With the early varieties they, like the strawberry, have but a short time between bloom and mature fruit, and if conditions are not congenial there is usually a failure; for instance, if the roots are submerged in water or in soil too wet and cold fertilization is seriously impaired. When soils are wet and cold the lower stratum of air is approximately chilled, just the conditions unfavorable for the maturing of pollen, which is a very delicate life germ and also the delicate insects that are instrumental in its distribution. If in time of fertilization we study the cherry or any bloom through the microscope we will soon see the importance of warm air and sunshine for best results.

Experience tells us that where the wild crocus first blooms is the location for the cherry, South or Northeast slopes, but not low ground; the next best location is high ground, but cold wet soil must be avoided. We sometimes see good results on level land, but there is usually sub-earth drainage leaving only capillary moisture. The orchard of Mr. Ivins is seemingly low and level but a stratum of sand beneath makes conditions favorable.

We are badly in need of good cherries for a time covering a season of a month or more. The importation of varieties from Europe, and all our

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cherries are European, may help us out of the dilemma. We have now fixed types of black and red cherries. Selection of varieties don't seem to solve the problem for us. We must cross and plant seeds. The wind and insects of past generations have done the work easily for the older countries, and generations of selections have assigned the different varieties to local adaptability. We are a progressive people and cannot wait generations for selection; we must aid natural agencies, as nature sows seeds not a thousandth part of them grow, but with intelligent aid they nearly all grow.

In an experimental way I have some reasons to believe that the good sweet cherries of Iowa will contain the dark blood of Northern Europe.

The cherry, as we know it, is a dainty feeder, not a gross feeder. We must temper its food, soil, and winds to its needs. The stock upon which we graft cherries is of as much importance as that of the plum or apple. Until within the last year the Mazzard was considered the most hardy, but the winter of '99 destroyed that delusion along with many others. *Prunus Pennsylvanica* has been tried and is not satisfactory, though it is perfectly hardy, but as a rule the union is bad. The Mahaleb is now considered to be our best stock, until we find a better one, which beyond a question is in the bushels of pits that in criminal carelessness we are throwing away. It has been suggested that there is a hope of utilizing our wild black cherry as a stock which is not probable, as it belongs to a different race of cherries. We can undoubtedly cross a *Pennsylvanica* with our common cultivated cherry and produce a good stock with a possibility of starting a new race of cherries that may lead to good results. This cross, if not difficult to obtain, simply puts the *Pennsylvanica* where it will bloom and mingle with that of the desired cherry. The seeds of the wild cherry grow as far north as the white pine. I don't know of any more interesting field of experimental work with a possibility of such grand results. Will we try?

THE WAY TO SUCCESSFUL ORCHARDING IN THE NORTHEREN FRUIT BELT.

BY J. S. HARRIS, LA CRESCENT, MINN.

The writer has had a practical expeirence in the propagation and growing of nursery trees and the planting and cultivation of orchards, and wide opportunity for observation under a great variety of conditions covering a period of more than sixty years. and thirty years of that has been devoted to the study and practice of horticulture in Minnesota and Wisconsin. In that period of time I have witnessed a few reasonable successes, and failures almost without number. Happily the successes are increasing at a cheering rate and the failures decreasing in a like proportion, as the climate, soil, more favored locations, varieties, methods of planting, cultivation, management, etc., are becoming better understood through the influence of live horticultural societies, the work of public and private experimentalists and the knowledge gained through our agricultural colleges and agricultural and horticultural periodicals. From past experience and careful observation I am led to believe that rapid strides are about to be made and that in the near future the pomology of northern Iowa, Minnesota, South Dakota and

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western Wisconsin will rank with, if not excel that of any other section of the United States, in all fruits that are adapted to growing in any section of the North Temperate Zone. The soil and climate is peculiarly adapted to the production of apples of most beautiful appearance and exquisite flavors, and such varieties as are adapted here are not surpassed in any other country.

There are a few essentials to succes that should be observed and practised by those who would succeed, viz: Selection of favorable site and soil, the best trees and subsequent care etc.

The best soil for an orchard is a clayey or stony, sandy land that is not deficient in lime and that has been cleared and cultivated long enough to subdue its wild nature and put it in good condition. The best site or location for an orchard is upon rather elevated ground, with good soil and air drainage, and it is best to be nearly level or sloping gently towards the north or east, but even quite steep hillsides of those slopes answer very well, but are a little more difficult to plant, cultivate and harvest the fruit. If the planting is to be done in the spring (which I think is the safest and best time for this region) the ground should be plowed in the fall previous very deep, at least as deep as holes for setting will be required. It is better not to plow the ground again in the spring, but to fit it for planting with harrow or cultivator and dig the holes for trees only as they are needed for planting the trees.

The best trees to plant are strong, healthy two or three year old root grafts. These, if not of satisfactory varieties, may afterward be top worked to any varieties desired, but the foundation should, in all cases, be a root graft, and if the orchard is planted with a view of future top-working it should be of trees as hardy and strong growing as the Virginia crab, Hibernal, Antonovka or Russians of the Anis family. In no case is it advisable to use the ordinary budded trees furnished by commercial nurserymen as they are most usually worked upon seedling stocks of doubtful and variable degrees of hardiness, and necessarily worked a few inches above the ground, and when they are planted in the orchard a portion of the tender stock remains above the surface of ground exposed to injury, such trees are like the house of Scripture that was built upon sand; some day they will go down.

The best root graft is one made by using healthy, well grown one year old seedlings raised from American northern grown seeds, and the seeds for the purpose are better if saved and selected from mature fruit of the hardiest known varieties. The imported French stocks and seedlings grown from seed of poor and immature fruit saved at eastern and southern cider mills should be avoided if long lived, healthy trees are desired. The best scions to use are those cut in the autumn and secured from as far north as the seasons' growth thoroughly ripens, and taken from trees that are vigorous and healthy, in no case should they be procured from a warmer or more torrid climate; remembering that nature is gradually adapting her products to climatic conditions and environments. The best length of root to use in making the graft is about five inches, and never using any but the first and second cut from one seedling no matter how long it may be. The crown graft will produce more first class trees than the second cut and the proportion of good trees that can be produced on the third cut are very limited. Three bud scions are, in my experience, better than longer ones and should be of about the same diameter as the top of the root. These root grafts may

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be planted and grown in nursery until from two to three years old when the trees will be ready for planting in the orchard. In the nursery set the grafts in about four feet apart and one foot apart in the rows for producing the best grade of trees. In setting the upper bud of the scion should be about even with the surface of the soil and they should be kept cultivated and growing through the season, but not stimulated by special fertilizers to make an abnormal growth. The advantage of this length of root and short scion is that the trees will in the first season make a stronger and better ripened growth and the trees when finally transferred to the orchard will start into growth at once and throw out stronger and better roots above the point of grafting than from the long scion where the roots may be more numerous but coming from older wood in which the vitality has been lowered by the process of grafting are more like the roots upon layers. These trees should be properly pruned and shaped while yet growing in the nursery.

The modern large commercial nurseries are a great convenience, if not necessity, but better results could generally be obtained if every orchardist could graft and grow his own trees than by procuring them through agents from distant nurseries, but if they are to be purchased, they should be secured from the most honorable nurseries nearest at hand, and by dealing direct with the grower instead of through agents, who solicit orders for the money there is in it. Within the last ten years the orcharding business has been greatly injured through the work of irresponsible and horticulturally ignorant agents, and almost millions of trees that were not suited to this climate have been sold and planted, and only brought disappointment and loss. Trees for the orchard should be dug with as little injury to the roots as possible, and never unnecessarily exposed to sun, drying winds, or frost. I like best to have them dug in the fall after the growth is mature and the foliage has been killed by frost and is easily stripped off. They should be carefully heeled in or buried over winter. When trees are stripped and dug too early their vitality is lowered, while if digging is delayed until spring the young growth may have received some injury in a hard winter and delay their starting growth somewhat. In setting trees the holes should be dug large and deep enough to take in the roots in natural positions and to stand about two inches deeper than they grew in the nursery, using fine soil to fill the holes and packing it well over and among the roots, finishing up with about an inch of fine mellow soil on the surface, and a light mulch over this is beneficial. Trees in the orchard should not be set to close together. Two rods apart each way is a good distance for planting them, perhaps forty feet between the rows and twentv feet in the rows would be equally as good or better, if every alternate tree was an early bearing and shorter lived variety or of upright habit, or if they could be removed as soon as the remaining ones needed more room. It is detrimental to the orchard to leave the trees growing in grass or to crop the grounds with small grains. In an old orchard a spring tooth harrow is a good thing for tearing up the grass roots and keeping the surface soil mellow, and in younger orchards it is no detriment to the trees to raise early hoed crops among them if the soil is occasionally treated to fertilizers. The trees should stand as nearly upright as possible, or leaning slightly towards the west or south. The hardy are best started at a hight of three feet from the surface of the ground, and winding the trunks with strips of white cotton cloth or burlap, or placing about them vaniers or

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lath screens are a good preventive of sun scald and afford protection against rabbits. The orchard should be securely fenced against all kinds of stock. A little judicious pruning will sometimes be needed, but no heavy pruning at any one time. Keep a sharp lookout for injurious insects and do not allow them to get a foothold in the orchard. Dig out borers when found and spray for codling moth. Keep up the fertility of the soil; gather the fruit carefully, pack honestly and put it upon the market in neat and good condition, and the orchard will pay better than any other portion of the farm. Use, as far as possible, varieties of fine appearance and good quality, and such as are known to succeed best in the locality where the orchard is planted.

THURSDAY FORENOON.

REPORT OF DELEGATE TO SOUTHEASTERN SOCIETY.

BY W. H. GUILFORD, DUBUQUE.

Your delegate arrived at Muscatine after an unusual amount of delays in train connections. The attendance was rather small, particularly so, when we take into consideration that Muscatine is one of the fruit centers of the state. It seems strange that a community so financially interested in fruit culture should be so careless of availing themselves of the benefits of such a meeting. The personal of the attending members was such as would be helpful to all classes whether they grow fruit for pleasure or profit. The attending delegates were received in a cordial and hospitable way by officers and members, making us feel, though in a new territory, as among old friends. President Fultz, as a presiding officer, is a grand success. He is at home in handling the society, knowing when and where to touch the button for anything he wanted, and he seemed to have an abundance of good material. The lessons conducted by members was something of an innovation to your delegates and is well worth the serious attention of even our state society. As all the papers before the meeting will appear in the report your delegate will confine this report to what could be read between the lines and in the fruit room and lobby.

The display of apples was large and remarkably good, with perhaps not as many varieties as Mills county could show, yet for adaptability and economic value their display was an object lesson worth seeing and remembering. Of course Ben Davis was prominent in all exhibits. Gano showed up well and such colossal Jonathan, Rome Beauty and Grimes. Northwestern Greening is about, with them, as it is with us, but their Wealthy is very poor and is classed as a summer apple. Their display of Longfield was a fair article of Kaump. I noticed the Windsor (Wisconsin) was in all collections and regarded as a coming apple. Black Annette is also a favorite. I heard many speak highly of Liveland Raspberry, this is one of the good Russian apples that is downing opposition, it ripens with or before Yellow Transparent. To those who are afflicted with chronic opposition to everything Russian I would prescribe Liveland Raspberry.

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There seems to be a pear growing boom in the near future; as a starter there was two plates of Kieffer. We hope they will succeed with better pears. There seems to be many very old trees that are fruitful and good, evidently they are on their own roots and their fruitfulness and longevity suggests own roots for success. Mr. Eden, of Lone Tree, has fine pear trees bearing on thorn (our large sweet red thorn of the woods). This thorn stock is used in northern Europe. In pear growing we might learn something by looking back. Mr. C. G. Patten's paper "The Future of Horticulture in the Mississippi Valley" was listened to with close attention. Yes, the horizen of the future is bright with prospective pyramids of beautiful pomology and the Godess Flora will strew from the horn of plenty.

Mr. Rolland Sherbourne's paper gave close attention to seeds and seedlings for the nursery "any old thing" is not good enough, start the kindergarden nursery on the farm, intelligence breeds independence, educate, investigate, propagate.

Mr. F. O. Harrington told us how to handle the tree from nursery to orchard. It was a complete encyclopedia and guide to planters. In the discussion the "Tree Peddler" got a terrible larceration; he occupied a back seat and smiled in a silence that was golden.

Mr. Blodgett in "Notes of the Season" would not admit being "Plum crazy on the Peach" but considered peaches on the brain a mild impeachment. By the way they are all big with peaches down there, but they fluctuate a good deal. It is not the Bailey now, it was proved up in the meeting to be tender, perfectly hardy, colossal in size, skinny peach pits etc., etc. But the Lone Tree peach is pouring oil on the troubled waters; it is a fine large peach and unlike the Bailey, it is blessed with an eternal sameness. A sceptical old duffer on a back seat—stage whispered—"Champion, or any of the old varieties is just as hardy."

Samuel Rowe (may his tribe increase) sent in a paper "Trees in Grass." This is no inovation by Mr. Rowe, he sounded the note of warning years ago. Experience at a fearful cost tells us today that Mr. Rowe was right. He leaves all the cut grass in the orchard and gives additional food as the trees regave it. This paper was discussed at length and heartily endorsed by Mr. Lathrop and many others. Mr. Watrous remarked that if Mr. Rowe is right most of the eminent horticulturists are wrong.

"Snap Shots" by Mr. Langham, of Cedar Rapids, was short range shrapnel for the state society. Mr. Langham wants more money for subordinate societies. Mr. Branson explained, that aside from the appropriation, the only revenue the state society had was annual membership, as life members had ceased to be of financial value to the society.

Maps explained by Secretary Greene showing the ereas in which a few varieties of the apple succeed best, was regarded as a substantial move in the right direction. An effort was made to load the state secretary with complimentary resolutions, all of which Mr. Greene declined, explaining that the work was done in the line of duty as secretary of the state society.

Mr. Branson's lesson on the blackberry developed the fact that Snyder was the favorite. Early Harvest had a few friends but some claimed it rusted badly and "don't put blackberry in the orchard, raspberry might do but blackberry never." The lessons are a good thing; members rise to speak

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only when they are called on by the teacher and he generally knows who is loaded.

Mr. Harrington, of York Center, in a paper, gave as his experience with persimmons that seedlings should be mulched the first winter, after which he thinks they are hardy. He has several varieties, and prospects indicate the persimmon is a comming fruit for the south part of the state. His success in grafting is seventy-five per cent. In the discussion the pucker was eliminated, or rather relagated to the joke department.

The recommended fruit list in apples was as follows: Yellow Transparent, Liveland Raspberry, Duchess, Wealthy, Fameuse, Windsor, N. W. Greening, Ben Davis. Jonathan, Willow Twig, and McMahon.

I would advise all who can to attend their next meeting at West Branch. The Southeastern Society is a bright instructive class of fruit growers. It is a pleasant memory to have been with them.

REPORT OF DELEGATE TO WISCONSIN HORTICULTURAL SOCIETY.

BY A. E. BENTS, CRESCO.

Your delegate arrived at Madison at five o'clock Tuesday morning. Hotel headquarters were at the Capital House.

The meeting was held at the capitol, in the senate chamber, and was called to order at nine o'clock and committee appointed on reception of delegates. The program was taken up and F. C. Edwards gave an interesting talk on "How to conduct a correct nursery." No apples were brought out, the varieties generally planted are about the same as those with us in Iowa; such as Duchess, Wealthy, Malinda, Northwestern Greening, McMahon White and Wolf River, being the favorites. The friends of the Russian varieties were all absent, or at least, did not come to the front. A. D. Barnes of Waupaca county, reported growing 1,300 bushels of Northwestern Greening in 1898, and trees all in good condition at present time, while others reported very unfavorable of same variety. It appears that those farthest north are having the best success with apples. This goes to support the theory that location and soil have more to do than varieties or climate.

Secretary Philip has a large orchard and is growing many varieties successfully; he recommends top-working very highly. Mr. Philips in his report shows that he is doing a grand work on his experimental grounds. He concluded by saying that all we had to do to grow all the fall apples that we wanted was to plant and cultivate.

The afternoon was devoted to small fruit; valuable papers were read and a general discussion followed. Your delegate was somewhat surprised to see the interest that was taken in the growing of small fruit, every person present was growing for market and when some one told of shipping ten or twelve car loads at one shipment; your humble servant made up his mind that he was not in the small fruit business. Most growers advocated growing strawberries in matted rows, Warfield, Bederwood, Haverland, were general favorites with the majority, while a number spoke of many others and new

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varieties. Raspberries, Loudon, Turner, Marlboro, Ohio, Older and such are favorites.

Wednesday morning opened with plum growing, and Professor Goff read a paper on "Plum Growing from a Commercial Standpoint." Several papers were read and the usual discussion followed, and so many good varieties were recommended it was hard to tell which had the most friends.

The afternoon of the third day was occupied at the experiment station, but on account of stormy weather I could not look over the grounds, but as I was shown through the different departments was favorably impressed with what I saw there. Everything was in first-class condition and showed that there was care taken in all departments.

REPORT OF DELEGATE TO MINNESOTA STATE SOCIETY SESSION OF 1899.

BY W. A. BURNAP, CLEAR LAKE.

Pursuant to your instructions I met with the 1900 winter meeting of the Minnesota State Horticultural Society in their rooms in Minneapolis. President W. W. Pendergast, of Hutchenson, occupied the chair, and that old horticultural veteran, A. W. Latham, did honor to the secretary's table. All possible kindness and courtesy was shown your delegate, and personally he thanks you for the enjoyment of a very pleasant and profitable meeting.

Time and space will not permit even an epitome of the many valuable papers and discussions there had, therefore, the best performance of my duty to this sociery suggests that I call your attention topically to such matters as I think worthy of your attention at this meeting and space in our annual report.

The Fruit List:—In apples remains nearly the same as during the last few years; the only change being that they have advanced Patten's Greening from the "for trial" list and placed it in the list of "first degree of hardness" and added Cross (413) to the trial list. The list now reads: of first degree of hardiness, Duchess, Hibernal, Charlamorff, Patten's Greening; of second degree of hardiness, Wealthy, Longfield, Tetofsky, Malinda. For trial, Okabena, Peerless, Repka Malenka, Anisim, Yellow Sweet, Kaump, Gilbert, Brett, Christmas, Blushed Calville, Cross (413), White Pigeon.

You will notice that twelve out of the twenty varieties mentioned are Russians, so the Russians still "hold the fort" in our sister state.

The small fruits, as recommended, are too nearly like our own list to warrant recapitulation here.

The fruit exhibit was very fine both as to number of varieties displayed and quality of specimens shown. About sixty varieties of apples were upon the tables, and the varieties were about equally distributed between the Russians, newer seedlings and our old apple list.

The State Fair Fruit Display. Report made to this meeting shows that at the state fair last preceding it, there was displayed approximately 5,000 plates of fruit, surely a great showing for a state that cannot raise fruit. Much of this display was brought about by a judiciously arranged sweepstakes premium.

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That thousand dollar apple has not yet been found, and our Minnesota friends still offer this sum for any seedling that will meet the requirements laid down. I gave notice that we of northeastern Iowa proposed to win that money, and if our friend Patten cannot capture the prize some of the rest of us must bestir ourselves, or the reputation of your delegate as a prophet is forever lost.

Lake Superior Fruit Growing.—A number from there reported that owing to cool summers and short seasons late varieties of apples did not ripen their fruit, but that moisture from the lake gave a healthy growth, and those kinds that did properly ripen produced finer fruit than those raised further south. He also stated that for the same reasons trees were not as badly injured by blight as in more southern locations. If all this member reports prove true, as years advance, we may find a new rival in the Lake Superior country for the production of summer apples.

Red River Valley Orcharding.—North Dakota people identify themselves with the Minnesota society, and they were present with quite a delegation. Everything up there in a horticultural way is purely experimental, but they report Hibernal, Arctic and Toman as "promising." Professor Hoverstad, of Crookston Experiment Station, said that the only tree with him that looked really well, was Patten's Greening, and this succeeding in a winter where the thermometer went down to 50° below zero, and when Duchess, Wealthy, Hyslop, and Transcendent all either died or killed back. That seems good evidence on the question of the hardiness of Patten's Greening.

Root Killing.—As this meeting immediately succeeded the great loss of 1898-9 the subject received much time and discussion. While difference of opinions on methods existed, debate developed the unanimous opinion that a hardier stock must be found for seedling roots, and every effort made to induce grafts to root from their scions. .

Orchard Cultivation.—The cultivation of orchards to induce growth and fruitfulness and to prevent root killing proved a disputed question as usual, but the majority insisted that for safety to the trees some method should be used which would leave the ground with some cover crop in winter.

The Agricultural College.—The society spent one-half day and evening at this school and the members were its guests at supper in their superb dining hall. Their new horticultural hall is a fine building and under Professor Green's management promises much good for Minnesota horticulture. One thing here called my especial attention, it was their Agricultural School, separate and distinct from their Agricultural College. Here boys and girls can come immediately from the farms and spend from October first to April first learning what they most need to know at home. Why has not Iowa a like school?

In Memoriam.—One-half day was devoted to the memory of Peter M. Gideon, the originator of the Wealthy apple, and many tributes were feelingly and eloquently thereto tendered. Since his death much of his undeveloped horticultural work was in danger of being lost, but I understand that the society has now made arrangements so that everything possible will be saved and utilized.

Our Honored Member.—C. G. Patten was made an honorary life member at this meeting and in the November No. of the Minnesota Horticulturist his picture and biography were published. As your delegate, I to the best of

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my ability, in your behalf, thanked the society for this honor conferred upon him and us, and I am sure that herein I but spoke your unanimous minds.

The Woman's Auxiliary.—The question of how to increase membership is a live one with our Minnesota friends as with us, and as one method of solving it they have formed a Woman's Society Auxiliary to the State Horticultural Society.

The woman's organization meets at the same time as the State Society but in different rooms, I understand it is establishing county branches, and is expected, in many and various ways, to help and assist the masculine society.

Here is a matter for you to think over and work out, and in presenting this for your last consideration I respectfully submit this report.

REPORT OF DELEGATE TO MINNESOTA SOCIETY—SESSION OF 1900.

BY J. S. TRIGG, ROCKFORD.

Your delegate attended the whole of the sessions of the Minnesota State Horticultural Society, at Minneapolis early in December. This state has a very live and enterprising society, the members of which work most harmoniously together. The average attendance at the meetings was over two hundred, and there was a display of choice fruit of Minnesota growth which was not only a surprise to all who saw it, but a wonderful tribute to the state and the enterprising men who produced it. Among this fruit was a very large number of promising seedling apples, the well known offer of the society of $1,000 for a seedling apple which should combine the hardiness of the Duchess, the quality of the Wealthy, and the keeping quality of the Melinda having given a wonderful stimulus to the propagation and development of seedling apples. There were thirteen entries in competition for this prize this year, but they all fell short of the requirements. While this ideal apple for Minnesota may never be developed, it is still true that many choice varieties will be. The seedlings originated by the late Peter M. Gideon, of Minnetonka, were very promising, his Peter apple, a seedling of the Wealthy, and closely allied with it, having better keeping qualities, being a great favorite. The Surprise plum of the American type attracted much attention, and is easily the favorite in size and quality of all the plums now grown in that state. As exhibited it was the largest plum of all, and was rated high in quality. Patten's Greening apple was reported fruiting heavily in Manitoba, while Hibernal, Anisim, Antonovka, and others of the Russian variety were warmly commended in the territory north of St. Paul to and beyond the Manitoba line. In this territory the quality of the apple is a secondary consideration provided it is hardy. All advocated the deep setting of the apple tree; some stating that eighteen inches below nursery depth was none too much. All the western part of Minnesota has more or less of arid conditions to meet in fruit culture, and deep planting and very thorough surface cultivation have proved the best safeguards against loss from drought. It developed that the Wealthy apple is at home through most of the south half of the state; that there was an unlimited demand for Wealthy apples in the cities of

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St. Paul and Minneapolis; that it kept well in cold storage and when placed upon the market was preferred by the consumer to any apple shipped from the south or east, save the Jonathan and one or two other rare and high-priced varieties. This fact was deduced from what was brought out at the meeting, viz: that given a suitable site and proper care, the growing of the Wealthy apple for the market gave great promise of large financial returns.

The question of forestry is a very live one in Minnesota, not only in the matter of growing timber on the prairie sections of the state, but also in the matter of preserving some remnant of the magnificent forests of the north part of the state, which the lumbermen and forest fires have well-nigh ruined. The effort being made by the people of that state to have the 800,000-acre timber and lake Indian reservation near Cass Lake set aside by the government as a great national park, was warmly endorsed by the society. For windbreaks on the prairie soils of the state the Scotch pine was most heartily commended. Your delegate was impressed with the enterprise and enthusiasm of these Minnesota horticulturists, carrying on their work, as they do, under climatic conditions less kindly than those which prevail in our own district. There is among them much interest in the subjects indirectly allied with horticulture—improved highways, rural mail delivery, improvement of school-house grounds, home decoration of lawn and garden. A brief report such as this cannot do justice to the good work of the association. The effort being made by the society to secure the sum of $1,000 with which to erect a suitable memorial to the late Mr. Gideon, the originator of the Wealthy apple, should have the hearty co-operation of all fruit growers in the territory covered by our society. The sum of $250 was raised at the meeting for this purpose. Your delegate begs to acknowledge the receipt of many courtesies at the hands of the officials of the Minnesota society, and bespeaks for a closer and more intimate acquaintance by Iowa fruit men with our Minnesota friends, who are doing so much to advance the science of horticulture.

REPORT OF COMMITTEE ON RESOLUTIONS.

Your committee desires to report as follows:

Resolved, That first and above all the society feels indebted to G. A. Ivins, our treasurer, for his persistent efforts to make this meeting a success, and desires to give him its thanks therefor.

Resolved, That we favor the holding of the annual meeting of this society on such days of the week, in the third week of December, as may be for the best interests of our own meeting, regardless of the Southwestern Society.

Resolved, That this society express its appreciation of the faithful and efficient work done by its officers during the past year.

Resolved, That we thank the people of Iowa Falls for their kindness and courtesies extended in many ways for our entertainment.

W. A. BURNAP,
JOE TRIGG,
L. A. DUMBOLTON.
Committee.

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TREASURER'S REPORT.

BY G. A. IVINS, IOWA FALLS.

1899.	RECEIPTS.	
November 27, to balance	$ 62.44	
November 28, received from secretary	21.00	
December 5, received from state association	150.00	
Total		$233.44

1899.	DISBURSEMENTS.	
November 30, paid W. A. Burnap, director	$ 8.78	
November 30, paid A. J. Phillips, hotel	2.50	
November 30, paid E. H. Dart, hotel	1.00	
November 30, paid Geo. H. Van Houten, hotel	1.75	
November 30, paid A. E. Fryer, delegate	2.50	
November 30, paid W. H. Guilford, director	14.25	
November 30, paid G. A. Ivins, expenses	16.60	
November 30, paid C. F. Gardner, expenses	4.11	
November 30, paid Mrs. Alice Beach, premium	3.00	
November 30, paid Elmer Reeves, expenses	9.99	
November 30, paid Bates, janitor	2.00	
November 30, paid J. B. Mitchell, premium and hotel	13.00	
December 5, paid F. G. Barnard, premium	2.00	
December 8, paid C. H. True, railroad and hotel	7.71	
December 7, paid C.H.True, salary and expenses secy's office.	61.55	
December 7, paid W. B. Perry, premium	3.00	
1900.		
February 10, paid J. C. Ferris, delegate	7.40	
February 10, paid G. A. Ivins, exchange and stamps	1.00	
Total		$162.14
Balance		$ 71.30
November 22, received from state association		150.00
Total balance on hand		$221.30

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REPORT OF COMMITTEE ON FRUIT EXHIBITS.

Your committee to award of premiums beg leave to report and recommend the following awards:

Best collection apples grown by exhibitor—

J. B. Mitchell, first ..... $ 6.00
G. A. Ivins, second 4.00

Best collection seedlings grown by exhibitor—

J. B. Mitchell, first 2.00

Best seedling not exhibited prior to 1896—

J. B. Mitchell, first 4.00

Best collection recommended for Northeast District—

J. B. Mitchell, first 3.00
C. H. True, second 2.00
Best plate, Wealthy, J. B. Mitchell 1.00
Best plate, Longfield, J. B. Mitchell 1.00
Best plate, Fameuse, C. H. True 1.00
Best plate, Walbridge, C. H. True 1.00
Best plate, Plumb's Cider, C. H. True 1.00
Best plate, Hibernal, J. B. Mitchell 1.00
Best plate, Northwestern Greening, Henry Cooper 1.00
Best plate, Malinda, Elmer Reeves 1.00
Best plate, Kaump, G. A. Ivins 1.00

Best ten varieties worthy of cultivation not in list—

Best plate, Annette, C. H. True ..... .50
Best plate, Haas, C. H. True ..... .50
Best plate, Antonovka, J. B. Mitchell ..... .50
Best plate, Romna, J. B. Mitchell ..... .50
Best plate, Adamson, G. A. Ivins ..... .50
Best plate, Wolf River, G. A. Ivins ..... .50
Best plate, Talman Sweet, E. T. Gifford ..... .50

Best display evaporated apples—

C. H. True 3.00

Best display canned fruit—

Mrs. Ivins 3.00

EUGENE SECOR,
ELMER REEVES,
O. W. MOORE,
Committee.

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REPORT OF COMMITTEE ON TREASURER'S REPORT.

Your committee on treasurer's report for the year ending on above date, have examined the accounts of Mr. G. A. Ivins, treasurer, and find them correct.

W. H. GUILFORD,
L. A. CLEMONS,
Committee.

SECRETARY'S REPORT.

The conditions and feelings which characterize this sixteenth annual meeting of our society are very different from the circumstances under which we met one year ago. Then we met as veterans coming out of a fearful conflict with the element of an uncontrolable nature. Saddened but not subdued, crippled yet unconquered and undaunted, and with a determination to repair the breach that had been made in the fortifications which our hands had been strengthening during the year past, and which during our winter dreams of security were torn and rent as by the sudden explosion of some submarine mine. Today we come together inspired by the successes of the past year, strengthened in the hope of future prospects of prosperity and success, while the disasters through which we have passed have only wedded us still more closely to our preferred vocation.

Perhaps no other branch of industry is more subject to reverses and radical changes or is more susceptible of perpetual improvement than the work of horticulture, while the busine s of tree planting and fruit growing is as ancient as the centuries, still there is no limit to its development and no end to n w experiences in the perpetuation of this important industry, and notwithstanding the frequent backsets to which this avocation is subject, and the disparagements which are placed in its way by those who fail to appreciate its blessings and benefits, still the work progresses rapidly, and its blessings are being more widely dispensed year by year, under the supervision and through the tireless efforts of the man of plants and trees, who has set his mind and heart and hand to the extenuation of an exalted occupation that never reaps where it has not sown, and which bestows blessings unawares, even upon those who have expressed their prejudice against the means employed in making him their possessor. The true horticulturist is deserving of more praise and less condemnation from an ungrateful public, who to a greater or less extent, have gratified their appetites by their self-invited indulgence in the enjoyment of the valuable products resulting from his unceasing efforts. It is true that he who causes two blades of grass to grow where before only one had grown, or, that he who plants a

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single seed and causes it to multiply itself a hundred fold is a public benefactor, what might be truthfully said of him who by his study, skill, and genius has assisted nature to conceive and bring forth and develop things she had never before conceived of, thus placing before the world trees of greater endurance, symmetry and beauty, fruits greatly improved in size, texture and quality, flowers more luxuriant and graceful, more fruitful vines with pendant clusters or aromatic, luscious sweets. For all of which too many have failed to express their appreciation.

The real purpose of this meeting would not be fully realized should any one of its members fail to impart to others some word of encouragement, some helpful suggestion, or valuable information, resulting from his past year's research, experience, or observation; as producers and propagators and experimenters we differ widely in our individual taste, and while the attention of one is employed in developing some special feature of horticultural industry, another devotes his time and study to some other line of the work equally important, while the general interests are recognized by all and the minor things are not ignored. For a few years past I have paid special attention to the matter of what I would term orchard surgery and plant nursing, and my study of this subject has more fully confirmed my belief that the wise man was right when he declared: "To every thing there is a season and a time to every purpose under the heaven," and especially has the truthfulness of his other saying been verified in my experience when he added: "A time to plant and a time to pluck up that which is planted." I have learned that mother nature will respond as readily to assist intelligent effort on our part in the restoration of lost vital powers in plant and tree as she will to assist scientific agencies that may be employed by the physician and nurse to restore the waning physical forces and energies in animated beings. In a sense the offices of nature are similar to that of a storage battery, many of her powers are held in reserve as latent forces to act only when acted upon, and when we by intelligent thought are able to make proper connection with those forces she will not fail to respond to our endeavors to assist her in the development of more perfect productions than she unaided by human device has ever been able to bring forth. The truth of this statement has never been more fully and clearly demonstrated than by the evidences produced in the results realized by the process of plant breeding, and hybridizing by cross fertilization, so far as man's efforts avail in his attempts to bring about a higher state of perfection in the products of the orchard and fruit fields, the observance of two simple rules will very largely determine the degree of success that may reasonably be anticipated in the results of his plans and labors, namely these: The doing of a thing in the proper season and doing it in the right way. Before undertaking the amputation of a human limb the surgeon will wait until reaction sets in and the injured person recovers a degree of strength to enable him to undergo the operation, but in orchard surgery the rule is reversed, for the injury sustained by the tree should be treated at once. A few minutes time, a lump of wax or clay, and a strong bandage made use of at the right time might have made a healthy, fruitful tree of many hundreds that now stand as leafless skeletons, or that have been added with the multitudes of their race to dead and decaying heaps that have been cremated amidst the smoke and heat of crackling flames.

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The subject of top-grafting has been to me during the past few years a matter of no little concern and interest, and in this work I have not only received much pleasure in the performance of the operation but have also been highly gratified by the results and amply rewarded by the pains taken. I find the most favorable season for this work to be the late spring time just as the buds are beginning to swell. During the past three years at about the time mentioned I have taken scions directly from the tree that I desired to multiply and as a result have succeeded in getting more than ninety-five per cent. to live and grow, some of which have made a growth of not less than four feet during the past season. By practical tests I have learned that Talman Sweet succeeds well worked on Whitney crab, and that it has thus endured the effects of our coldest weather better than when grown as root-grafted trees. I have also demonstrated to my own satisfaction that Fall Orange, Fameuse, and the Annette apple are congenial to the Virginia crab as a stock and that when thus grafted produce apples of increased size without impairing the quality to any perceptible extent. Both the Wealthy and Fameuse have formed perfect union with the Duchess as a stock, the tendency being when thus united to force the latter variety into earliest bearing; Plumb Cider and Ben Davis are other varieties that seem to unite well with the Duchess stock. While Fameuse worked upon Hibernal and the Northwestern Greening upon Virginia crab appear from the past season's growth to be well mated, yet one or even two seasons is not sufficient time to determine which of the two varieties is the more rapid grower. Of the several varieties which I have tried to unite with the Duchess only one has proven too thrifty in growth to form a smooth and perfect union, and that sort is the Mann apple.

During the past twelve years I have not failed to devote a few of the busy hours of spring time and summer to the improvement of the surroundings of the place called home; nothing seems to add more beauty and grace to one's dwelling place than a well kept evergreen hedge; it is not only a source of constant enjoyment and pleasure to the possessor, but is also admired by every observant passer-by and from whom we hear many flattering comments and expressions of their gratification in looking upon its beauty. The expense of starting a live hedge and its subsequent care is but a trifle when compared with the pleasures derived from its ever green presence during all seasons of the year. For the purpose of hedging I can confidently recommend to all possessing a similar soil and elevation, the two evergreens, Arbor Vitæ and Hemlock Spruce. These in my experience have proven to be perfect in all respects for the purpose mentioned. I have also had experience with the Red Cedar as a hedge tree, but it is more liable to be affected by disease and the changes of our seasons than the varieties spoken of and is less reliable. For further pleasing effect let us place in the lawn inside of the hedge, a specimen of the graceful Weeping Birch, another is the compact Rocky Mountain Dwarf Pine, the beautiful Douglas Spruce, one Chinese Golden Dwarf Arbor Vitæ that varies the colors of its foliage with the change of the season. Some choice specimen of the Black Hills Spruce we must not omit, and lest we should forget one worthy of a place among its champions of beauty we will venture to complete the list with the Abies Concolor, with its silvery mantle and conical form, and to these selections I will not bar another from the privilege of adding their favorites. For hardy

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flowering shrubs and plants to further decorate the lawn, I beg to introduce the hardy Hydrangea, Tree Honeysuckle, Spirea Van Houte, the Golden Glow, and a Prairie Queen rose. While these may n t prove the choice of everyone, and while they do not cover the entire list of desirable ornamentals for the home grounds, yet the lawn which contains even these will not lack for some of the essentials that go to make joyous hearts, happy homes. No man liveth to himself is true wherever written or read, and so every endeavor we may put forth to render earth's dwelling place pleasant and enjoyable instead of simply endurable will prove an object lesson to our neighbors and friends and will encourage them to emulate our examples, in providing for themselves and their children such surroundings of comfort and pleasure as shall make them to realize the true import of the familiar and oft repeated saying, there's no place like home.

FINANCIAL REPORT OF THE SECRETARY OF THE NORTH-EASTERN IOWA HORTICULTURAL SOCIETY.

Received in membership fees at annual meeting, Iowa Falls, Nov. 29, 1900		$ 18.00
EXPENSES OF THE OFFICE.		
Paid for stationery, postage and postal cards during the year	$ 5.10	
For printing 500 programs	8.00	
For badges (50) for use of society	2.50	
Total expenses		$15.60
Paid over funds to G. A. Ivins, treasurer		18.00
Total		$33.60
Total receipts	$18.00	
Total disbursements	33.60	
Balance due secretary		$15.60

C. H. TRUE,
Secretary.

FRUIT LIST FOR 1901.

Explanation—In the markings 1 indicates that the variety is perfect in hardiness, while 2 indicates a degree less hardy, etc., until 6 is reached, which indicates that the variety is very unreliable or worthless. The same rule holds true in the markings for quality; I, indicates that the variety thus marked is recommended for top-working on some hardy and congenial stock. E. S., stands for early summer; S., summer; F., fall; E. W., early winter; W., winter; L., late; M., medium.

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A few varieties which do not appear in the tabulated list have been mentioned by individuals as possessing special merit, as follows:

J. R. Mitchell has recommended Red Warrior, Voronesh, White Queen, and Antonovka.

W. H. Guilford, Porter, Fall Orange, Willowtwig, Ben Davis, Yellow Transparent, Pewaukee.

O. A. Kenyon, Never-Fail, Alexander, Early Washington, 4 M, or Ostrakoff.

Edson Gaylord, Fall Queen, Shanklin.

B. F. Ferris, Iowa Blush, Yellow Transparent.

Elmer Reeves, Yellow Transparent.

E. M. Sherman, Newel's Winter, Charlamof.

R. P. Speer, Cole's Quince, Grimes Golden, Winesap, Jonathan, Williams' Favorite.

G. A. Ivins, Shrute, Silken Leaf, Rankins, Scott's Winter.

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TABULATED FRUIT LIST FOR NORTHEASTERN IOWA FOR 1900 AND 1901.

NAMES AND ADDRESSES.	APPLES.																					
	DUCHESS.			WEALTHY.			TETOFSKY.			LONGFIELD.			FAMEUSE.			WALBRIDGE.			PATTEN'S GREENING.		
	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.
Eugene Secor, Forest City, Winnebago Co...	1	S.	3	2	F.	1	1	E.S.	2	2	F.	2	....	....	....	....	....	....	1	F.	3
W. A. Burnap, Clear Lake, Cerro Gordo Co..	1	S.	3	3	E.W.	1	....	....	....	....	....	....	....	....	....	....	....	....	1	E.W.	2
J. B. Mitchell, Cresco, Howard county.....	1	S.	....	3	E.W.	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
J. Ridley, Burr Oak, Winneshiek county.....	1	S.	3	2	F.	2	....	....	....	1	F.	2	....	....	....	....	....	....	1	F.	4
W. H. Guilford, Dubuque, Dubuque county..	2	S.	3	2	L.F.	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
A. E. Bents, Cresco, Howard county.....	1	S.	....	1	F.	....	1	E.S.	2	....	....	....	....	....	....	....	....	....	2	F.	3
F. G. Barnard, Waukon, Allamakee county..	1	S.	3	2	F.	1	1	E.S.	2	2	F.	1	3	E. W	1	3	W.	3	1	F.	3
O. A. Kenyon, McGregor, Clayton county....	1	F.	2	2	F.	1	2	S.	3	....	....	....	....	....	....	....	....	....	....	....	....
Albert Shindelar, Calmar, Winneshiek county	1	E.S.	1	1	F.	1	....	....	....	1	W.	1	....	....	....	1	W.	1	2	E.W.	3
Isaac Johnson, Eldorado, Fayette county.....	1	S.	3	2	F.	2	....	....	....	2	F.	2	....	....	....	2	W.	3	1	F.	3
J. H. Ulton, Cresco, Howard county.....	1	S.	3	1	F.	2	1	E.S.	2	2	F.	2	....	....	....	....	....	....	1	E.F.	4
J. W. Bateman, Delaware, Delaware county..	1	E.S.	1	1	S.	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
C. H. True, Edgewood, Clayton county.....	1	S.	2	2	F.	2	1	E.S.	1	2	F.	3	3	E. W.	1	3	W.	3	1	F.	3
J. S. Trigg, Rockford, Floyd county.....	1	....	2	1	....	1	....	....	....	2	....	2	2	....	1	....	....	....	....	....	....
Edson Gaylord, Nora Springs, Floyd county..	1	S.	4	3	T.E.W.	2	....	....	....	....	....	....	3	T.E.W	2	....	....	....	....	....	....
G. A. Ivins, Iowa Falls, Hardin county.....	1	S.	2	2	F.	1	....	....	....	....	....	....	....	....	....	....	....	....	2	F.	2
Elmer Reeves, Waverly, Bremer county.....	1	S.	3	2	F.	1	1	S.	2	2	E.W.	2	....	....	....	....	....	....	1	F.	3
C. E. Gardner, Osage, Mitchell county	1	S.	2	1	E.W.	1	....	....	....	2	E.W.	2	....	....	....	....	....	....	2	E.W.	1
A. T. Anderson, Waterville, Allamakee Co..	1	E.F.	4	2	F.	2	1	S.	2	....	....	....	3	E.F.	1	....	....	....	....	....	....
R. P. Speer, Cedar Falls, Black Hawk county	1	S.	3	3	T.F.	2	....	....	....	....	....	....	....	....	....	....	....	....	2	T.F.	3
E. M. Sherman, Charles City, Floyd county..	1	S.	3	2	E.W.	1	....	....	....	....	....	....	....	....	....	....	....	....	1	E.W.	2
C. F. Gardner, Osage, Mitchell county.....	1	S	3	2	E.W.	1	1	E.S.	2	1	E.W	3	....	....	....	....	....	....	1	E.W.	3
B. F. Ferris, Hampton, Franklin county.....	2	S.	2	2	F.	1	1	S.	1	2	E.W.	2	....	....	....	....	....	....	....	....	....
Total number reporting.....	23	....	....	23	....	....	10	....	....	12	....	....	5	....	....	4	....	....	15	....	....

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TABULATED FRUIT LIST FOR NORTHEASTERN IOWA FOR 1900 AND 1901—CONTINUED.

NAMES AND ADDRESSES	APPLES.																					
	MALINDA.			PLUMB CIDER.			N. W. GREENING.			HIBERNAL.			WHITNEY.			PEACH.			KAUMP.		
	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.
Eugene Secor, Forest City, Winnebago county	....	....	....	....	.....	....	....	.....	....	1	F.	5	1	E.F	2	....	.....	....	....	.....	....
W. A. Burnap, Clear Lake, Cerro Gordo county	....	....	....	....	.....	....	3	T. W	2	1	F.	4	....	.....	....	....	.....	....	....	.....	....
J. B. Mitchell, Cresco, Howard county	....	....	....	....	.....	....	....	.....	....	1	F.	....	....	.....	....	....	.....	....	....	.....	....
J. Ridley, Burr Oak, Winneshiek county	....	....	....	....	.....	....	....	.....	....	1	F.	4	1	S.	2	....	.....	....	1	F.	4
W. H. Guilford, Dubuque, Dubuque county	....	....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....
A. E. Bents, Cresco, Howard county	2	W.	2	2	E. W.	1	1	W.	2	....	.....	....	....	.....	....	2	S.	1	....	.....	....
F. G. Barnard, Waukon, Allamakee county	....	....	....	2	E. W.	2	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....
O. A. Kenyon, McGregor, Clayton county	....	....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....
Albert Shindelar, Calmar, Winneshiek county	1	W.	1	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	2	E. W.	1
Isaac Johnson, Eldorado, Fayette county	2	W.	2	1	E. W.	2	....	.....	....	1	E. W.	4	....	.....	....	....	.....	....	....	.....	....
J. H. Upton, Cresco, Howard county	3	W.	4	....	.....	....	1	W.	4	1	F.	6	....	.....	....	....	.....	....	....	.....	....
J. W. Bateman, Delaware, Delaware county	....	....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....
C. H. True, Edgewood, Clayton county	....	....	....	2	E. W.	2	....	.....	....	....	.....	....	1	E.F	2	....	.....	....	....	.....	....
J. S. Trigg, Rockford, Floyd county	....	....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....
Edson Gaylord, Nora Springs, Floyd county	3	W.	4	3	T. E. W.	3	4	T. W.	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....
G. A. Ivins, Iowa Falls, Hardin county	2	W.	3	....	.....	....	2	W.	2	....	.....	....	....	.....	....	....	.....	....	....	.....	....
Elmer Reeves, Waverly, Bremer county	2	W.	4	....	.....	....	3	W.	2	....	.....	....	....	.....	....	....	.....	....	....	.....	....
C. E. Gardner, Osage, Mitchell county	....	....	....	....	.....	....	2	W.	1	....	.....	....	....	.....	....	1	S.	1	....	.....	....
A. T. Anderson, Waterville, Allamakee county	....	....	....	1	F.	3	1	E. W.	3	....	.....	....	....	.....	....	....	.....	....	....	.....	....
R. P. Speer, Cedar Falls, Black Hawk county	....	....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....	....	.....	....
E. M. Sherman, Charles City, Floyd county	3	W.	4	....	.....	....	3	W.	2	1	F.	2	....	.....	....	....	.....	....	....	.....	....
C. F. Gardner, Osage, Mitchell county	....	....	....	....	.....	....	2	W.	3	1	F.	6	....	.....	....	1	S.	2	....	.....	....
B. F. Ferris, Hampton, Franklin county	....	....	....	3	E. W.	1	....	.....	....	....	.....	....	....	.....	....	....	.....	....	2	E. W.	3
Total number reporting	8	....	....	7	.....	....	10	.....	....	8	.....	....	2	.....	....	3	.....	....	3	.....	....

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TABULATED FRUIT LIST FOR NORTHEASTERN IOWA FOR 1900 AND 1901—CONTINUED.

NAMES AND ADDRESSES.	PLUMS.																	
	WYANT.			ROCKFORD.			DE SOTO.			WOLF.			HAWKEYE.			FORKST GARDEN.		
	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.
Eugene Secor, Forest City, Winnebago county	....	....	....	....	....	....	1	.....	.....	1	....	....	....	....	....	....	....	....
W. A. Burnap, Clear Lake, Cerro Gordo county	1	....	1	....	....	....	1	....	1	....	....	....	1	....	2	....	....	....
J. B. Mitchell, Cresco, Howard county	....	....	....	....	.....	....	1	L.	1	....	....	....	1	S.	2	1	E.	2
J. Ridley, Burr Oak, Winneshiek county	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
W. H. Guilford, Dubuque, Dubuque county	....	....	....	....	.....	.....	1	L.	2	.....	....	....	1	L.	3	1	E.	2
A. E. Bents, Cresco, Howard county	....	....	....	....	....	.....	1	L.	2	1	M.	2	1	L.	3	....	....	....
F. G. Barnard, Waukon, Allamakee county	....	....	....	....	....	.....	1	....	....	1	....	....	....	....	....	....	....	....
O. A. Kenyon, McGregor, Clayton county	....	....	....	....	....	....	1	S.	1	....	....	....	....	....	....	....	....	....
Albert Shindelar, Calmar, Winneshiek county	....	....	....	.....	....	....	1	....	1	1	....	1	1	E.	2	....	....	....
Isaac Johnson, Eldorado, Fayette county	....	....	....	....	....	....	2	.....	.....	....	....	....	....	....	....	....	....	....
J. H. Upton, Cresco, Howard county	....	....	....	....	....	....	1	F.	1	1	F.	1	....	....	....	1	E F	1
J. W. Bateman, Delaware, Delaware county	....	....	....	....	....	....	3	L.	3	....	....	....	....	....	....	1	L.	1
C. H. True, Edgewood, Clayton county	....	....	....	....	....	....	2	L.	2	1	M.	3	1	L.	3	....	....	....
J. S. Trigg, Rockford, Floyd county	1	....	1	1	....	2	1	.....	1	....	....	....	1	....	2	....	....	....
Edson Gaylord, Nora Springs, Floyd county	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	....	....
G. A. Ivins, Iowa Falls, Hardin county	.....	....	....	....	....	....	1	E.	1	.....	....	....	1	M.	1	....	....	....
Elmer Reeves, Waverly, Bremer county	1	S.	3	....	....	....	1	S.	2	.....	....	....	....	....	....	....	....	....
C. E. Gardner, Osage, Mitchell county	1	S	1	....	....	....	1	S.	1	....	....	....	....	....	....	1	S.	1
A. T. Anderson, Waterville, Allamakee county	....	....	....	....	....	....	1	S.	1	2	S	2	....	....	....	....	....	....
R. P. Speer, Cedar Falls, Black Hawk county	1	M.	2	....	....	....	1	L.	.....	....	....	....	1	....	....	....	....	....
E. M. Sherman, Charles City, Floyd county	....	....	....	1	....	2	1	E.	1	....	....	....	....	....	....	....	....	....
C. F. Gardner, Osage, Mitchell county	1	M.	2	1	M.	1	1	E.	2	....	....	....	....	....	....	....	....	....
B. F. Ferris, Hampton, Franklin county	....	....	....	....	....	....	1	E.	1	1	M.	1	....	....	....	....	....	....
Total number reporting	6	....	.....	3	....	....	21	.....	....	8	....	....	9	....	....	5	....	....

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TABULATED FRUIT LIST FOR NORTHEASTERN IOWA FOR 1900 AND 1901—CONTINUED.

NAMES AND ADDRESSES	PLUMS.						CHERRIES.											
	MINER			STODDARD.			EARLY RICHMOND.			MONTMORENCY.			WRAGG.			OSTHEIM.		
	Hardiness.	Season.	Quality	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.
Eugene Secor, Forest City Winnebago county	....	....	....	....	....	....	1	...	.	1	..	..	....					
W. A. Burnap, Clear Lake Cerro Gordo county	....	....	....	....	....	....	3		2	..	....		3	..	2	..	..	....
J. B. Mitchell, Cresco Howard county	....	....	....	....	....	....		..	..			..	1		..	..	..	...
J. Ridley, Burr Oak, Winneshiek county	....	....	....	....	....	....								.	..	.	..	...
W. H. Guilford, Dubuque, Dubuque county	....	....	....	....	....	....	2	E	2	2	L	2	..	.	..			...
A. E. Bents, Cresco, Howard county	....	....	....	....	....	....	1	...	2	..	..		1	L	3			...
F. G. Barnard, Waukon, Allamakee county	....	....	....	....	....	....											.	...
O. A. Kenyon, McGregor, Clayton county	2	F	1	....	....	....	1	E S	2	1	E S	2	..	..	...		..	.. .
Albert Shindelar, Calmar, Winneshiek county	....	....	....	....	....	....	1	..	2			..	1		1		..	...
Isaac Johnson, Eldorado, Fayette county	2	L	....	....	....	....	2		3			..	2		3		..	....
J. H. Upton, Cresco, Howard county	....	....	....	....	....	....	2					..	2	..		..	.	....
J. W. Bateman, Delaware, Delaware county	1	L	1	....	....	....					..				..	...		....
C. H. True, Edgewood, Clayton county	1	L	2	....	....	....	2	E S	2	..		..	1	L	3			....
J. S. Trigg, Rockford, Floyd county	....	....	....	1	....	2	..	...							..	..	..	....
Edson Gaylord, Nora Springs, Floyd county	....	....	....	....	....	....	..								..		....	....
G. A. Ivins, Iowa Falls, Hardin county	....	....	....	1	M	1	2	E	..	..	....		2	L	..	..		...
Elmer Reeves, Waverly, Bremer county	2	F	3	..	....	....	2		2				1		2	..		..
C. E. Gardner, Osage, Mitchell county	....	....	....	....	....	....	2	S		...					..	1	S	
A. T. Anderson, Waterville, Allamakee county	....	....	....	....	....	....	1	S	2	..	.			..	..	1	S	2
R. P. Speer, Cedar Falls Black Hawk county	....	....	....	....	....	....	2				...	....	...	....	..		..	....
E. M. Sherman, Charles City, Floyd county	....	....	....	1	....	3	1	E	1	..			.		..	..		...
C. F. Gardner, Osage, Mitchell county	....	....	....	....	....	....	2	E	2	2	L	2	..	..			..	..
B. F. Ferris, Hampton, Franklin county	....	....	....	..	....	....	2	E	2	2	L	2			..	..		.
Total number reporting	5	....	....	3	....	....	17			5			9	..		2		

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TABULATED FRUIT LIST FOR NORTHEASTERN IOWA FOR 1900 AND 1901—CONTINUED.

NAME AND ADDRESS.	GRAPES.																	
	CONCORD.			WORDEN.			MOORE'S EARLY.			AGAWAM.			BRIGHTON.			NIAGARA.		
	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.
Eugene Secor, Forest City, Winnebago county	1	....	....	2	....	....	2	....	....	....	....	....	....	....	....	....	....	....
W. A. Burnap, Clear Lake, Cerro Gordo county	1	F.	2	1	S.	2	....	....	....	1	F.	1	....	....	....	....	....	....
J. B. Mitchell, Cresco, Howard county	1	L.	2	1	M.	2	....	....	....	....	....	....	1	E.	1	....	....	....
J. Ridley, Burr Oak, Winneshiek county	1	....	2	1	....	2	1	....	2	....	....	....	1	....	1	....	....	....
W. H. Guilford, Dubuque, Dubuque county	2	L.	2	2	M. E.	2	2	E.	3	3	L.	1	....	....	....	....	....	....
A. E. Bents, Cresco, Howard county	....	....	....	1	....	1	1	....	2	....	....	....	....	....	....	2	....	1
F. G. Barnard, Waukon, Allamakee county	1	....	2	1	....	1	1	....	2	2	....	1	....	....	....	....	....	.....
O. A. Kenyon, McGregor, Clayton county	1	F.	1	1	F.	1	....	....	....	....	....	....	....	....	....	....	....	.....
Albert Shindelar, Calmar, Winneshiek county	1	....	2	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Isaac Johnson, Eldorado, Fayette county	1	L.	3	1	....	1	....	....	....	1	....	2	....	....	....	....	....	.....
J. H. Upton, Cresco, Howard county	2	F.	2	2	F.	1	....	....	....	....	....	....	....	....	....	2	F.	3
J. W. Bateman, Delaware, Delaware county	3	L.	3	3	E.	1	3	E.	1	....	....	....	....	....	....	3	L.	1
C. H. True, Edgewood, Clayton county	1	L.	3	1	M.	1	2	E.	2	3	L.	2	2	M.	2	3	L.	2
J. S. Trigg, Rockford, Floyd county	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Edson Gaylord, Nora Springs, Floyd county	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
G. A. Ivins, Iowa Falls, Hardin county	....	....	....	1	E.	....	1	E.	....	....	....	....	....	....	....	....	....	....
Elmer Reeves, Waverly, Bremer county	1	F.	2	1	F.	2	1	S.	2	....	....	....	....	....	....	2	F.	2
C. E. Gardner, Osage, Mitchell county	2	....	2	1	....	1	1	....	1	....	....	....	....	....	....	.....	....	....
A. T. Anderson, Waterville, Allamakee county	2	F.	1	2	S.	1	....	....	....	....	....	....	....	.....	....	....	....	....
R. P. Speer, Cedar Falls, Black Hawk county	1	....	....	1	....	....	1	....	....	....	....	....	....	....	.....	....	....	....
E. M. Sherman, Charles City, Floyd county	2	....	1	1	....	1	1	....	3	....	....	....	....	.....	....	....	....	....
C. F. Gardner, Osage, Mitchell county	1	....	2	1	....	2	1	E.	2	....	....	....	....	.....	....	....	....	....
B. F. Ferris, Hampton, Franklin county	2	L.	2	2	E.	1	1	E.	1	....	....	....	....	.....	....	.....	....	....
Total number reporting	19	....	....	22	....	....	14	....	....	5	....	....	3	....	....	5	....	....

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LIST OF SMALL FRUITS REVISED FOR THE YEAR 1900.

Blackberries.—Snyder, Ancient Britton.

Raspberries, Black.—Ohio, Older, Palmer, Eureka, Gregg, Nemaha, Kansas.

Raspberries, Red.—Turner, Loudon, Columbia.

Currants.—Victoria, White Dutch, North Star, Lee's Prolific, Red Dutch, Long Bunch Holland, White Grape, Champion.

Strawberries.—Crescent, Bederwood, Parker Earle, Robinson, Clyde, Gandy, Warfield, Haverland, Enhance, Gardner.

Juneberries.—Dwarf Success.

G. A. IVINS,
J. B. MITCHELL,
A. G. BENTS,
Committee.

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NINTH ANNUAL MEETING

OF THE

Northwestern Iowa Horticultural Society,

HELD AT

EMMETSBURG, IOWA.

DECEMBER 4, 5, AND 6, 1900.

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NORTHWESTERN IOWA HORTICULTURAL SOCIETY.

LIST OF OFFICERS.

PRESIDENT.

P. F. KINNE.....Storm Lake

VICE-PRESIDENT.

J. C. WINSET.....Fostoria

SECRETARY.

W. B. CHAPMAN.....Washta

TREASURER.

B. SHONTZ.....Correctionville

DIRECTORS.

First District—H. N. Antisdel.....Fostoria
Second District—L. A. Clemons.....Storm Lake
Third District—A. S. Caulkins.....Storm Lake
Fourth District—A. W. Hatfield.....Correctionville
Fifth District—H. L. Felter.....Washta

HONORARY MEMBERS.

Erwin, A. T.....Ames
Greene, Wesley.....Davenport
Wood, Joseph.....Windom, Minn.
Wragg, M. J.....Waukee

LIFE MEMBERS.

Antisdel, H. N.....Fostoria
Hatfield, A. W.....Correctionville
Shontz, B.....Correctionville

ANNUAL MEMBERS.

Antisdel, Mrs. A. W.....Fostoria
Allred Bros.....Emmetsburg
Baynum, James.....Correctionville
Bennett, J. C.....Emmetsburg
Beckman & Schroeder.....Emmetsburg
Benda, J. K.....Emmetsburg
Bing, J. C.....Ottosen
Branagan, W. I.....Emmetsburg
Brown, M. L.....Emmetsburg
Brown, W. J.....Emmetsburg
Caulkins, A. S.....Storm Lake
Chapman, W. B.....Washta
Clemons, L. A.....Storm Lake

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Connor, C. W.....Sac City
Crouch, F.....Emmetsburg
Davis, Dr. J. C.....Emmetsburg
Dean, J. A.....Sioux City
Dealy, Frank.....Emmetsburg
Felter, H. L.....Washta
Foy, Andrew.....Emmetsburg
Freeman, F.....Emmetsburg
Gowans, James.....Emmetsburg
Greene, Wesley.....Davenport
Gylling, P. F.....Emmetsburg
Hoover, J. K.....Emmetsburg
Hub, The.....Emmetsburg
Jacobs, H. H.....Emmetsburg
Kinne, George.....Emmetsburg
Kinne, P. F.....Storm Lake
Kreiger, W. T.....Emmetsburg
Linderman, W. L.....Emmetsburg
Ludwig, Carl.....Sioux City
Mayne, L. H.....Emmetsburg
McCarty, Geo. B.....Emmetsburg
McNally, John.....Emmetsburg
Nolan, P. O.....Emmetsburg
Ormsby, E. S.....Emmetsburg
Paulson, J. C.....Emmetsburg
Peddie, Alex.....Emmetsburg
Price, Chas. D.....Ruthven
Richardson, W. H.....Webster City
Shadbolt, H. C.....Emmetsburg
Shaw, J. J.....Emmetsburg
Shea, Robert.....Emmetsburg
Smith, C. A.....Emmetsburg
Stemets, J. T.....Emmetsburg
Tipp, D. C.....Osgood
Vaughan, W. H.....Emmetsburg
Walker, J. L.....Emmetsburg
Winset, J. C.....Fostoria
Wragg, M. J.....Waukee

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LIST OF PREMIUMS.

TO BE AWARDED AT THE NEXT ANNUAL MEETING AT ROCKWELL CITY, DECEMBER 3, 4, AND 5, 1901.

CLASS A.

Best collection of named apples and crabs	$10.00
Second best collection	5.00

CLASS B.

Best collection of named apples and crabs grown by exhibitor	7.00
Second best collection	5.00

CLASS C.

Best collection of seedling apples grown by exhibitor	3.00
Second best collection	2.00

CLASS D.

Best plate of any variety of apple of proved value in the district	.50
Best plate of any variety of apple of probable value in the district	.25

CLASS E.

Best plate of seedling apples not previously exhibited	2.00
Second best plate	1.00

CLASS F.

Best collection of canned fruits	2.00
Second best collection	1.00

The same fruit will not be awarded two premiums. Exhibitors will properly label varieties and file with secretary a full list of varieties in each exhibit. If exhibits are small and unworthy of premiums offered, the committee may make a smaller award or none at all. The successful exhibitor must become a member of the society before the premium will be paid. All exhibits must be grown in the district and all new seedlings must be accompanied by origin, history, and nature of soil and conditions in which grown.

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PROCEEDINGS

OF THE

Northwestern Iowa Horticultural Society,

HELD AT

EMMETSBURG, DECEMBER 4, 5, AND 6, 1900.

The society met in Music Hall on Tuesday afternoon, with President P. F. Kinne in the chair. The district reports were then read, a summary of which is here given.

SUMMARY OF DIRECTORS' REPORT.

The apple crop in northwestern Iowa was above the average. Fruit of better quality than usual. Favorable mention was made of Duchess, Whitney No. 20, Hibernal, and Wealthy.

The Buffalo tree hoppers reported numerous and destructive in Lyon and Osceola counties, and aphis in Buena Vista county.

Plums 75 per cent. of a crop; Miner and De Soto reported as doing the best.

Cherry trees not in good health; Wragg and Early Richmond reported as giving the best results the past year.

Blackberries, raspberries, and grape vines have not yet recovered from the injury to plants in the two years preceding, and many patches have not yet been reset. Currants and gooseberries about half a crop.

Strawberries were injured some by the drouth in the fall and spring; though the crop was reported good in many places.

MR. CAULKINS: The raspberry of which Mr. Clemons reports is called, I think, the Crimson Cluster. It is very productive, and I consider it hardy, as hardy as any I am growing. Its season lasts six or seven weeks, and for the first half the pickings are very large.

MR. CLEMONS: Hasn't it a very brittle vine?

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MR. CAULKINS: Yes, and it bends to the ground with its load of fruit.

MR. CLEMONS: I haven't seen its equal as a raspberry anywhere.

MR. CAULKINS: The only reference I have seen of it is in the Michigan report five or six years ago. This says it lacks fertilization, but I don't find it so.

MR. CLEMONS: In an old number of the Minnesota monthly report there is a variety described like it, and called the Royal Church.

MR. KINNE: I saw the vine of fruit for sometime this year and I think it wonderful. It ought to be in every one's garden. It is the largest raspberry I ever saw. It will not bear picking green; it crumbles to pieces and the stem comes with it.

MR. ANTISDEL: Will it bear transportation?

MR. CAULKINS: No, I think not; it is a soft berry, like all red varieties; but it is better than most reds in this respect. I shipped it to Sioux City and neighboring towns.

MR. DUNCAN: Have you other varieties near it?

MR. CAULKINS: Yes, the Cuthbert and Turner, but I shall discard the latter, as this is much superior.

REPORT OF DELEGATE TO NORTHEASTERN SOCIETY.

BY L. A. CLEMONS, STORM LAKE.

Meeting of Northeastern Iowa Horticultural Society convened at Iowa Falls, November 25th, at 2 P. M. Reports of directors were received and read; in discussion which followed the unanimous opinion seemed to be that although fruit trees were yet in full foliage, if only ordinary winter weather prevailed till Christmas there was no occasion for alarm. After much discussion it was decided that the Compass cherry had no value except as a curiosity.

An adjournment was taken to the fruit farm of Mr. G. A. Ivins, one and one-half mile north of town, located on a very rich, moist piece of upland prairie; everything has the best of cultivation and plenty of room for its best development. Among the good things shown us was a group of Northwestern Greening apples, twelve years set, very promising, in the best of shape where limbs have not been allowed to grow too close together, in such cases they are liable to slight injury in the forks. From all the evidence obtained by your delegate, at the meeting and elsewhere, am very favorably impressed with it, both in tree and fruit, and think it will do for us to recommend planting it for trial. We were also shown strawberry vines extending eight feet each side of the row of this season's growth; and at this time I want to commend Mr. Ivins; no man could have done more for the success

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of the meeting and to make it pleasant for the members and visiting delegates.

The evening session was devoted mainly to a paper on the Northwestern Greening apple by Mr. Burnap, of Clear Lake, and the discussion which followed it. Five had fruited it, four recommended setting it.

Wednesday morning session opened with reception of J. H. Herbst, Secretary of Wisconsin State Society and an appropriate response by him, also reception of your own State Secretary, Wesley Greene, of Davenport; then followed President Gardner's address in which many good suggestions were made. He commends the hybrid plum No. 2, a cross of Japan and De Soto. Mr. Guilford added much useful information in regard to this plum. President Gardner stated that its quality was up to the best Domestica plum, and thinks a desirable advance has been made in plum growing by its production; it is not larger than De Soto in size. Mr. Guilford thought there was more possibility of advance in plum growing than with any other fruit in Iowa.

J. L. Herbst, of Sparta, Wisconsin, read a paper on their trial orchard at Wausau, Wisconsin; in connection with it was shown a plat of same giving the position of each tree and its history. The orchard is situated on a northern slope; strong clay land, mixed with small stone and is well covered with snow in winter. It is about 130 miles from the lake.

Mr. Thompson, an extensive apple grower of Forest City, Iowa, gave a somewhat extended description of his orchard methods; he plants no crop on the orchard, just trees, cultivates well until July then lets the weeds and grass grow; does not depend on snow for mulch but puts three hundred pounds of coarse mulch around each tree; has 3,500 trees set three years.

Mr. B. F. Ferris recommends as the best six varieties of apples for family use; for summer, Duchess and Tetofsky; for fall, Wealthy and Plumb Cider; for winter, Walbridge and Northwestern Greening. Didn't want to be understood as recommending Walbridge, but it was the best he could give. J. C. Ferris would leave out Walbridge and substitute Gano. Mr. G. Hunt preferred Plumb Cider to either for winter. An interesting paper by J. C. Ferris on the commercial aspect of fruit raising in northern Iowa will appear in next annual report. Secretary True recommended top-working Fameuse on Hibernal. Mr. Ferris recommends Hibernal as stock for small growing trees. Elmer Reeves said Northwestern Greening had proven a success on Hibernal as seen by him at Austin, Minnesota.

Profits of Iowa orchards as viewed from the past year's experience by Elmer Reeves. Thought the De Soto plum a standard, and that there was a great demand for it in its season. Said fruit should be put on the market in better condition both in quality of the fruit and in the package in which it was sold, and that if the fruit was grown in quantity large enough by any one, or in a locality, buyers would buy it on the trees without any trouble to the producer and that there would be a better profit than in other farm products, if the apples should be sold that way even at twenty cents per bushel.

J. L. Herbst, of Wisconsin, thought there should be more attention paid to getting the young men interested in the work of the societies as the older ones were dropping out, the introduction of new blood to carry on the work was desirable.

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Mr. Moore, of the Southern Minnesota Society, expressed himself as anxious to get the young men interested in horticulture, you could get them interested in a farmers' institute in raising cattle, hogs, and corn, but not in horticulture.

Mr. C. G. Patten spoke at some length on "New Things in Fruit," said there was twelve to fifteen new plums at the Iowa State Fair of promise and spoke highly of the one taking fourth premium. In apples said there was not many new things. At the fair his No. 3 Perry Russet took first premium, and keeps from November till March with him. His Ben Davis No. 3 was good, but does not keep as long as the Perry Russet seedling; took second premium; has a sweet Ben Davis which he considers of first quality. His Fameuse No. 1 is of great value for summer; thinks it better than Charlamoff. Has another seedling of Fameuse that does better East, but has a place here. Said North Star was too tender in skin, soon perishes, and that he had discarded it, but that it was a good apple.

Mr. Ivins, on four best strawberries, said Parker Earle was good on low ground and no good on dry locations. Crescent has been our best berry for all purposes. He gave for his choice Bederwood, Clyde, Warfield No. 2, and Haverland.[1]

Mr. Peck, of Minnesota, takes off the first runners that start. Said he got stronger plants in that way; recommended plowing ground in spring—plowing it three times with thorough pulverization each time. J. L. Herbst, of Wisconsin, recommended fall plowing, then again in spring, and then the use of spading disk and harrow before setting. Mr. McChesny recommends the use of coarse wild grass for mulch the first year after setting, and the next year well rotted manure. Said plow as above for setting. Prof. A. T. Irwin, of Ames, said they sow buckwheat in southwest Missouri and northwest Arkansas for mulch on their strawberry beds.

J. C. Ferris gave a talk on spraying. Said he had bulletins published, giving all necessary instructions; discussed it in a general way, and advocates barrel spray pumps as being most practical. Went over eleven acres in half day.

Evening session was taken up in part with discussion of advisability of change in time of holding their meeting which resulted in fixing it on the third week in December, and next place of annual meeting left to executive officers. This was followed by a very instructive and useful paper on plant breeding by Prof. Irwin, of Ames, Iowa, and ably discussed by Patten, Greene, Reeves, and others. Morning of 29th the convention met at 8 A. M., at which various committees' reports were made and officers elected for ensuing year. On the whole the meeting was successful for the purpose for which it was called, and was harmonious throughout.

MR. CHAPMAN: Was any practical plan reached for getting the young people interested in the society?

MR. CLEMONS: There was a long discussion on the subject but no satisfactory conclusion reached.

MR. KINNE: I met with our Nebraska friends two years ago. They were trying the plan of electing their young men to the

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various offices, but this did not seem to awaken any interest outside of those holding the positions.

MR. CAULKINS: The schools at Storm Lake are taking up the study of horticulture somewhat; the teachers ask the pupils to bring in specimens of plants, buds, blossoms, fruit, etc. We gather enthusiasm by meeting together from year to year; we might bring the boys.

MR. CLEMONS: I am certain that the introduction of the study of the elementary principles of horticulture into our public schools would be of great benefit to the pupils and our society also in the future.

MR. HATFIELD: I think we make a mistake in putting the boys in the fields and caring for the stock, but seldom put them in the orchard.

MR. RICHARDSON: I think the love of horticulture is largely a matter of heredity. Most of those who engage in the work are those whose parents were interested in it.

MR. CAULKINS: I get my boy interested in this way. He is fifteen years old and we live a mile from school; he wanted a bicycle; I gave him a chance to grow strawberries and gave him the results, which bought the bicycle. He now has a plum orchard and is greatly interested in the work. He gets all his money from his fruit patch.

MR. KINNE: In this connection it is interesting to note the efforts being made in Minnesota to get school children interested in horticulture and kindred work. These efforts are under the direction of the state superintendent of schools and the agricultural department of the state university. During the past season experiments were conducted by Prof. W. M. Hayes at the experiment station, showing the feasibility of having gardens on rural school grounds. The two experimental gardens at the station include the common field crops in systematic rotation, a number of annual flowering and vegetable crops grown as in an ordinary garden, also some perennial and ornamental shrubs and fruits grown to acquaint the children with them. These experiments have demonstrated that a garden only two or three rods in area is quite large enough for most purposes. The development of northwestern horticulture depends largely upon the school children of to-day, and I think here is a hint from our neighbors on the north worthy of consideration, but of course it involves a higher grade of country teachers than we can now boast of, and these I believe can only be got by better wages.

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TUESDAY EVENING.

This session was given up to the people of Emmetsburg, who gave a literary entertainment of exceptional merit.

WEDNESDAY FORENOON.

The president announced the following committees:
On fruit awards: Messrs. Burnap, Greene, and Bing.
Auditing: Messrs. Caulkins, Felter, and Hatfield.
The president then gave his annual address.

PRESIDENT'S ADDRESS.

BY P. F. KINNE, STORM LAKE.

Again the Northwestern Horticultural Society is called upon to mark the passing of another year, and I can assure the people of Emmetsburg that we take great pleasure in meeting here with you in your beautiful city, as our way down eastern friends think, way out on the ragged edge of the wild west. You have invited us to your city and extended to us such a hearty welcome that we feel at home and as the prime object of this horticultural society is to garner, and scatter horticultural knowledge that will benefit our homes, make us happier, healthier, and better men and women, we hope and trust that you will by your presence and interest in the work make of this one of the most successful meetings this society has ever held. We are here to help one another and we want you to meet with us, be one of us, engage in our discussions, give us your experience in what has proven a success with you and what has been a failure. The failures we need to know that others may not put good hard earned dollars in the same slot. We of the north feel good and feel like throwing our caps high because we have beaten the world. I say we although a member of our sister society, the Northeastern Horticultural Society, carried off a prize. Now they have taken a prize for the best apples in the world, while we of the northwest and one of your near neighbors, Mr. Parsons, took the cake for the best our fair state could show at our state fair. Why shouldn't we be proud, and we are here now to sharpen our wits and swap lies so we can keep them. I predicted ten years ago that northwest Iowa would eventually beat the

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remainder of the state in raising apples, and in looking over the apple exhibit at Des Moines it looked as if the prediction was about to be verified.

Each year the fruit interest becomes of more importance, the more we raise, the more we need, and our necessities keep fully up with the supply. We need have no fear of over production, we harvested this season the largest apple crop ever raised in northwestern Iowa, and yet we got for it good paying prices that left a margin of profit for the grower. Too much foreign fruit finds its way over our counties. We ought and we can produce better fruit than California can ship to us. It looks well but it does'nt taste well; lacks flavor, pleases the eye but not the palate. Yet may we learn a lesson from their methods. We now have summer and fall apples in abundance and suited to our climatic conditions but our crying need is winter fruit, and here we may profit by the experience of our California horticulturists. To reach our market their fruit is picked very green, and while it lacks in flavor it adds very materially to its keeping quality. Wealthy under ordinary conditions, if picked at the proper time, will keep till February if as carefully handled as they pack their fruit for shipment to us. Longfield although an early fall apple if allowed to mature fully on the tree has kept in good condition till the latter part of February and I have kept Anisim till the latter part of March while even Ben Davis if fully matured before picking will not lap much over January. Our great orchardists of southwestern Iowa cannot revel in their favorite Jonathan and Grimes Golden pets without early picking and careful handling for holiday use.

We are a class of students in the horticultural field, we have not raised and handled enough fruit to get past the A B C of the business, hence the value of attending these horticultural meetings and by a friction of ideas rub off the crude and select the perfect grains that are well developed and rounded to our needs and requirements. One cry of the campaign just closed has been expansion, well that's good for us, but there is no necessity for us to go among the islands of the sea to plant but let us expand and plant right here at home. We need it. Our wives need it, and our children need it, so let us plant and work and teach, and counsel together till we shall make of this great Northwest a veritable "Garden of Eden," so that all who come and all who go may eat and drink and make merry and each may leave behind a living monument of fruit or flower or plant.

THE BREEDING OF NATIVE NORTHWESTERN FRUITS.

BY N. E. HANSEN, BROOKINGS, SOUTH DAKOTA.

All are familiar with the severe conditions with which the planter has to deal who lives on the open prairies of the Northwest must realize the urgent need of a hardier list of fruits than we have at present. Before this association there is no need of going into details concerning the great annual losses experienced on the prairies by those attempting to grow many kinds of fruit. Five years ago, upon first coming into the state, my general knowledge of the conditions induced me to make a beginning in this work by gathering together wild fruit plants and trees from various parts of North and South Dakota and Manitoba. The determination to follow out this line of work

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was greatly intensified by attendance upon numerous farmers' institutes and by the many letters received from farmers who had failed in raising eastern and southern fruits. The work of raising seedlings was begun as soon as these plants began to fruit to any extent, which was in 1898. All the plants in fruits were carefully gone over and the seeds saved from the plants bearing the largest and best fruit. Seedlings were raised the following year and during the past season. A careful count this fall shows a total of over 27,000 seedlings, made up in round numbers as follows:

Sand cherry	8,400
Native plum	4,000
Grape	5,000
Wild strawberry crossed with tame	5,000
Strawberry, pure native	1,000
Pin cherry	25
Choke cherry	360
Golden currant	200
Black currant	2,200
Buffalo berry	180
Gooseberry	425
Raspberries, crossed with tame	200
Raspberry, pure native	40
Total	27,030

The most promising of new types of fruit is the Sand cherry (*Prunus Besseyi*). Some Dakota plants were already on the station grounds. Over 5,000 more plants, grown at Marcus, Iowa, by M. E. Hinkley, editor of the *Fruitman*, from seed he had gathered in northwestern Nebraska, at Valentine, near the South Dakota line, were obtained from Mr. Hinkley in the spring of 1896 and 1897 and seeds saved from the best plants as they fruited in 1898 and 1899. Of over 14,000 seedlings raised from these plants, 8,400 have been reserved for fruiting. The plants show the most wonderful variety in size and flavor as pointed out by Prof. Charles E. Bessey eleven years ago (American Pomological Society Report, 1899, p. 160) after examining the plants in their native habitat. Some of the plants found in this first plantation, most of which was grubbed up this fall, are of large size and with but little astringency. But little, in fact, remains to make this a choice table fruit, and it certainly makes a good fruit for culinary use.

In strawberries the work is being followed along two lines: First, by crossing with cultivated varieties. Second, by pure selection. The native types as gathered together from various parts of the Dakotas and Manitoba, several thousand of which have fruited, show marked diversity in size. All are excellent in quality. About twenty plants were selected the past season and layered in pots for pure plantations next year. In crossing strawberries, a new method was used in producing the 5,000 crossed plants out of 6,000 mentioned in the above list. In the fall of 1899 about 350 plants of native and cultivated varieties were taken up and grown in the greenhouse during the winter. The tame sorts included the ever-bearing sorts from France, as well as leading American sorts. As the blossoms appeared, the bi-sexual ones were emasculated and pollen from other varieties applied to these and to the pistillate blossoms. The plan in all cases was to have one of the parents wild and the other cultivated. The seeds were sown at once and germinated freely. The pure native seedlings were grown from

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fruit picked from small patches scattered through a plantation of a large number of cultivated varieties.

My methods are in brief an application of the principle laid down by Darwin that "Excess of food causes variation." In fact, I think that variation can be *compelled* to appear by such methods much sooner than by giving ordinary cultivation. The florist gives high feeding and culture to plants and reaches results much quicker than any other cultivators of plant-life by treating plants as individuals. The first few generations, then, apply the florist methods to any plant that we wish to modify or improve in any way. Break up the fixity of type. When this is done, then extend the work, grow plants by the tens and hundreds of thousands and select from large numbers for the points desired.

Crossing is resorted to whenever possible, as it hastens the process of evolution by introducing new elements of variation. Realizing, however, that crossing with tender cultivated species in many cases has given a lessened degree of hardiness, the main reliance is placed upon pure selection. For crossing, plants are obtained as far north as possible to give, so to speak, an excess or hardiness. The methods may be said to be a combination of those of Thomas Andrew Knight, of England, and Dr. Van Mons, of Belgium, modified and reenforced by personal visits to the grounds of numerous cultivators and improvers of plants in America and Europe.

Several other native fruits will be given attention the coming season, and a considerable quantity of seed has been gathered together from various parts of the Northwest.

Of work with cultivated fruits, the apple is made a leading feature. The main effort is to combine the hardiness of the Russian with the long-keeping capacity of the American varieties. The tender varieties have been grown the past three seasons in boxes and pots, and cellared over winter. The trees are on Paradise stocks. I hope for an "orchard house" as soon as legislative appropriations permit.

The minimum temperature at this station in the memorable winter of 1898–99 was forty degrees below zero Fahrenheit with the ground dry and bare of snow. It is plain that eastern and southern varieties are out of place in this region and yet native fruits are plentiful. We must take the hint given us by nature and develop a pomology of our own. No work is more worthy of the attention of the station horticulturist in regions where similar extreme climatic conditions obtain. Patience and perseverance must be the watch words. The amelioration of native plants leads to what may be termed "the strenuous life" in horticulture, but the work must be done. The field is great and the workers should be many.

MR. FELTER: Is the sand cherry worthy of cultivation?

MR. PRICE: Sixteen years ago I planted a peck of sand cherry pits and for ten years I have tried to get new varieties that were worthy of attention. As yet I have nothing that is of much good.

MR. HATFIELD: There are many of them in my neighborhood but are used very little.

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MR. KINNE: I have fruited them for several years but paid no attention to them till this year. The women folks at Mr. Clemons tried them and made such a favorable report that we tried them in our home and were well pleased. Mixed with apple it makes the best jelly we have. And we like it for sauce, as well as many of our plums.

MR. HATFIELD: They are much like the elderberry, must have something mixed with them.

MR. WRAGG: There are some things so fixed in type that they cannot be changed. Many attempts have been made with the sand cherry to make a cross of value, but nothing has been accomplished. I have tried it for fifteen years, using it for a stock for the cherry, hoping to increase the Morello type of cherries, but it would only be a few years before it would begin to throw out stolens representing the old sand cherry. It is a splendid stock for the Chickasas plum.

MR. CLEMONS: Do you hold with Mr. Knudson of Minnesota that he made a cross with the cherry?

MR. WRAGG: I think it is nothing but a variation, it is still a sand cherry.

MR. BURNAP: The quality of this Minnesota supposed cross is said to be good.

Mr. CLEMONS: I had a chance to test the fruit. It is most decidedly a sand plum.

Mr. FELTER: I think it much better to devote ourselves to our good native plums than to bother with the sand cherry.

The treasurer made the following annual report which was referred to the committee on accounts.

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TREASURER'S REPORT.

1899.	RECEIPTS.		
December 4.	Balance on hand	$ 196.28	
December 7.	Membership fees	96.00	
1900.			
November 23.	State society	150.00	
	Total		$ 442.28
1899.	DISBURSEMENTS.		
December 7.	John Craig, expense	$ 10.00	
December 7.	Smith & Knight, hall rent	30.00	
December 7.	Wesley Greene, expense	2.00	
December 7.	M. E. Hinkley, salary	20.00	
December 7.	H. L. Felter, expenses, premium	3.25	
December 7.	H. N. Antisdel, expenses, premium	18.75	
December 7.	John Craig, hotel expense	2.00	
December 7.	Edson Gaylord, expense railroad	8.10	
December 7.	J. C. Ferris, expense	.75	
December 7.	F. S. White, expense railroad	12.00	
December 7.	Geo. H. Van Houten, expense railroad	11.90	
December 7.	F. A. Hiser, premium	5.00	
December 7.	W. B. Chapman, salary, expense	85.30	
December 7.	H. N. Antisdel, expense	2.65	
December 7.	Clay County News, expense	7.50	
December 7.	H. Kunath, premium	6.00	
December 7.	Elmer Reeves, expense	1.75	
December 7.	F. A. Hiser, expense	4.00	
December 7.	A. W. Hatfield, expense	10.00	
December 30.	W. J. Reeves, expense	11.70	
December 30.	N. E. Hansen, expense	17.14	
1901.			
January 2.	Balance on hand	172.49	
	Total		$ 442.28

Respectfully submitted,

B. SHONTZ,
Treasurer.

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FRUIT GROWING IN WOODBURY COUNTY.

BY A. W. HATFIELD, CORRECTIONVILLE.

In the discussion of this subject we will first look into the conditions as they existed at the time when there was nothing but discouragement to look ahead at, and not even a wild crab apple in the county, which were so numerous in eastern Iowa.

With nothing but prairie grass for a distance of 100 miles, without not even a switch in sight, in the face of all this, how many young men are there that would have undertaken the cultivation of fruit prior to 1878. We were in a land where public sentiment insisted that it was only good for prairie grass, and was entirely out of the fruit range. First, everyone said the soil was not adapted to fruit growing, it being too dry and loose, and that we were too far north and west, and that fruit trees must freeze out; but with a love for fruit, together with the sight of fruit trees growing, I began to cast around for some way to establish an orchard. At that time I could see no other way than to plant apple seeds. I happened to know a man in the East who had a cider mill, and I wrote him, asking him to save me the seeds. He did so, and sent me three pounds of seed, which were the first seed of any kind sown on my homestead. These seeds were planted in the spring of 1869, which I think was the first apple trees grown in Woodbury county, and at the end of two years, on that poor, dry soil, I had as nice two-year-old trees as one would wish to look at. A good many of these trees are now bearing fruit in the south part of the county, and I have one of the finest winter apples that is to be found in the state, that came from that seedling nursery.

Later on the time came when I could procure grafted nursery grown trees, which I began to try. Being eastern grown trees I soon found that they were not adapted to our conditions, and I met with utter disappointment. By this time I could procure trees grown in Illinois, which the agent said would suit our conditions and soils exactly. In two years the same disappointment appeared; the trees were all dead. After experimenting on the same lines for eighteen years with the same results, and I was about to give it up as a lost cause, there came a new era in sight; it was a nursery started at Odebolt. Now I began to think that trees raised near home would come nearer fitting our conditions as to soil and climate, and not willing to give up the fight I plucked up courage and ordered another bill of trees, which I am happy to say are now giving me an abundance of apples for home use, and I wish to say if care is taken in getting varieties, that apples may be raised either for home use or the mercantile trade in any of the western counties of the state. I did not meet with the terror that some of the early orchardists did in regard to location. I just happened to select a northwest slope. The only reason I could give for this is tha I wanted the orchard to keep the north winds

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from my house. If I were to set out a new orchard, I would set first a row of Plumb Cider and then a row of Ben Davis, and then another of Plumb Cider, then a row of Walbridge, and still another row of Plumb Cider, and then a row of Wealthy, and then a good many rows of Plumb Cider. My reason for setting so many Plumb Cider is that they are very near a winter apple grown in our locality. So much for the apple.

Now let us look at the cherry. I soon learned it was no trouble to have plenty of cherries. I first planted Morello cherries and they went the same road as did my apple trees of first planting. I then got Early Richmond and they are doing their duty well. I experimented with various kinds of blackberries with many failures, but I finally got Snider, which did well for me for twelve years prior to the hard winter of '98 and '99.

I set my first currants in 1870, and they did good service from start to finish. I have nothing of very great importance in the way of plum culture, although I have produced a great many seedlings of which some were very good. We would think that no California fruit would thrive here, but I have six plum trees raised from pits of California plums that have been in bearing five years, and some are as fine plums for home use as I have seen anywhere, but they are too thin skinned for shipping. Of the six trees, not one died during the hard winter. And it so stimulated me that I am now trying the Western prune from pits secured in Oregon. Is it any wonder that the work has been so slow and that there is so little fruit on the farms of the West, but the time is coming when there will be plenty of fruit in every farm yard.

MR. BURNAP: What is your location?

MR. HATFIELD: High, rolling ground with heavy clay subsoil.

MR. BURNAP: How deep in your orchard would you have to go for water?

MR. HATFIELD: I have a well near-by forty-five feet deep.

MR. BURNAP: I can't understand how you report favorably of cherries and Ben Davis.

MR. HATFIELD: I picked this year ninety-seven quarts of cherries from an Early Richmond tree, thirteen years old.

MR. GREENE: I would like to suggest one thing here. The temperature at Sioux City, which is near Mr. Hatfield, is much higher than it is here. Sioux City is only a half degree colder than Glenwood, and nearly the same fruit can be raised there; the only difference is in the rainfall.

MR. WRAGG: Looking at the isothermal map you will find Woodbury county has the climatic conditions for growing plants that cannot be grown here. On the loess formation in that county the Ben Davis, Jonathan, etc., can be grown in Mills county.

MR. SHONTZ: I live on the Little Sioux in Woodbury county and have an orchard nine years old. The trees are very large and strong. The soil is a sandy loam, five feet to the gravel and ten feet to the water.

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ANOTHER YEAR WITH SMALL FRUIT.

BY A. S. CAULKINS, STORM LAKE.

Another year of practical work among the fruits has brought with it the complement of success and failures as usual. The constant recurrence of new and untried conditions, and conditions sometimes that are not under our control, render the testing of fruits and the expectation of a crop somewhat of an uncertain problem. Bearing these thoughts in mind it stands us in hand to note carefully and consistently the conditions under which our success or failure was achieved.

The small fruit crop the past season was not as large as usual and prices ruled higher. The shortage was due largely to the dry fall preceding. Strawberry plants were scarce and raspberries went into winter too dry to stand the winter's cold. Recent experiments prove that raspberry canes will stand a very low temperature if supplied with plenty of moisture. The prospect of a crop one year ago was generally reported quite favorable, but the crop was disappointing, being hardly one-fourth the ordinary yield. Conditions are somewhat reversed this year. With plenty of rain during the summer and fall strawberry beds are full of plants, too full, perhaps, for best results, while strawberry, raspberry, blackberry, and dewberry seem to be in excellent condition for an average winter. The last spring was unusual in some respects. Conditions were favorable for transplanting small fruits in April, but May was unusually dry and hot and many plants set this month went out, especially if set on loose soil. It is always safest to improve the earliest opportunity for planting, giving plenty time to overcome the ordeal of transplanting before hot weather comes.

As to the behavior of the various varieties I think it is well to report and compare notes, but these must be taken with allowance as different soils, elevation, moisture, exposure, drainage, and different management many account for success and failure of some variety. The Bubach strawberry has proven unprofitable with me. It grew enormous plant with dark green and glossy leaves, but not one plant in ten threw up a fruit stem. What berries I did get were bouncers, but the total yield was too small for profit. Bubach No. 5 has been recommended, I think, I shall test it. The Wm. Belt is the first to show effects of drouth, drying worse than Warfield and has shown no qualities superior to that variety. Parker Earle brings me loads of berries on low muck land well manured and well watered, but is a failure on dry soils. Other varieties, such as Lovett, Haverland, Bederwood, Crescent, Gandy, Brandywine, and Clyde have proven to be valuable. I prefer to let the other fellow pay the fabulous prices for new and untried varieties, and after he discards nine-tenths of them as worthless I will assist in determining the merits of the one promising variety.

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The primary testing of all fruits is the work of the experiment stations, and while we are obliged to test varieties in a small way owing to peculiar local conditions many failures can be prevented by noting their behavior at experiment stations. The Michigan state experiment station tested and reported on 146 varieties of strawberries in 1894. This is done at large expense to the state that we may profit thereby. Yet how often do we find farmers giving orders to agents of some remote nursery for new and untested varieties at fabulous prices when in fact the old established varieties are best suited to their needs and these could be had at reasonable rates of local nurseries or fruit growers. Right here one is strongly reminded of a cartoon that found its way into an eastern paper during the recent presidential campaign. It represented a farmer boy laboring faithfully to bring a sturdy young calf back to its mother but he persistently ran after a bunch of fatting steers. The boy was obliged to give up the chase and shaking his fist at the retreating calf called out: "Go it you little fool, you'll learn the difference when milking time comes."

As to varieties of raspberries, I have but little choice between Older, Kansas, Conrath, Eureka, or Pitts seedling. Gregg is good though a little more tender. Golden Queen is not productive, I have a large red variety called Crimson Beauty which is my choice of red varieties. Canes are dwarf in growth, hardy, very productive and of long season, fruiting more than six weeks. I picked over 400 quarts of the finest dewberries I ever saw from a little trial ground in my orchard, lowery weather during the season of ripening made the fruit large and fine. When we come to better understand the peculiarities of the dewberry it will be more largely grown.

The currant and gooseberry crop was shortened by late frost and cold rains during the blooming period. Plum trees not protected by shelter belts were thinned by the same cold wave while some trees well sheltered bore so heavily as to break down, and the difference in the quality of the fruit was quite marked. That from which a portion had been taken at the blooming period was of much finer quality. Taking it altogether the year has not been an unprofitable one to the fruit grower. It has been rich in experience and bounteous in prospects for the future. A year full of encouragement for the future of horticulture in Iowa.

MR. BURNAP: I went visiting late in the fall, when I came back my strawberry bed was a complete mat, there are no rows. Shall I thin them out in the spring or let them go?

MR. CAULKINS: I have the same conditions and hardly know what to do. Possibly I can go in with a disk harrow and cut out some but fear I shall injure many of the remaining plants. I have three times as many plants as I wish I had. I think we will get a good crop if the ground is rich and free of weeds but the berries will be undersize.

MR. WRAGG: If we have plenty of water the berries will be large; the strawberry is largely water.

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MR. KINNE: The same conditions eleven years ago, but heavy rains came in May and we had big berries. If we have a dry spring we shall have to irrigate to get good sized berries.

MR. BURNAP: You are on the Wisconsin drift, Mr. Caulkins. Name two best strawberries, pistillate and staminate?

MR. CAULKINS: That is hard to do. I get most fruit from Parker Earle. The Crescent is a number one farmer's berry, the Lovett is a fine berry, a good plant maker.

A MEMBER: I have tested many varieties near this city and like the Lovett. If I were to plant two varieties only, they would be the Clyde and Haverland.

MR. PRICE: The Crescent is splendid for home market, using Bederwood for fertilizing. The Lovett I use for the Warfield.

MR. CLEMONS: Does the Brandywine show tendency to rust with you, Mr. Wragg.

MR. WRAGG: No, except this year which was due to excessive moisture.

MR. DUNCAN: Does not rust here, but yields lightly; the berries of first picking are very large.

MR. BING: Concerning polination; I don't like the Bederwood for fertilizing the Warfield, the fruit is insignificant compared with the Splendid. I am using Bederwood with Splendid, Crescent with Warfield; Splendid is not a good plant maker but it has made enough for my purpose this year. For covering I use coarse marsh hay.

MR. PRICE: Have we anything better than Warfield, for productiveness, shipping, etc.

Mr. RICHARDSON: My experience puts Warfield in the lead with proper fertilizing. Bederwood is an excellent fertilizer but soft for shipping. Lovett is not so satisfactory as Splendid or Greenville. Clyde is a good berry as a staminate and is fairly firm. Michigan berries will stand shipment much better than ours; is there any process by which our soft berries may be made firmer?

MR. WRAGG: It is largely in the soil. I don't think there is anything we can do to remedy it. Crescent, Warfield, Bederwood; these are safe to plant.

MR. RICHARDSON: Warfield will do well under a greater number of circumstances and conditions than any other. Will stand more wet and drouth; a small plant but always gets there in good shape. I have some fungus growth on my plants this fall and also some insect pests. I would like to hear from those who have had experience in spraying and what formula to use.

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MR. BING: Send to State Agricultural College for bulletin on spraying.

MR. GREENE: The leafroller is the worst enemy of the strawberries for which no satisfactory remedy has been found. The slugs may be destroyed with Paris green or kerosene emulsion, if applied at the right time. For fungus disease, Bordeaux mixture is best. For quality I would grow Jessie, Chas. Downing or Haverland; Warfield and Crescent to sell. The first are not productive enough for commercial purposes. The Parker Earle of excellent quality, but requires moist soil and large quantities of fertilizers. For the amateur grower I would recommend berries of high quality rather than those that are good shippers.

MR. CLEMONS: Has Mr. Wragg on his experiment grounds the Cumberland raspberry?

MR. WRAGG: Yes, for one year. It promises remarkably well. Where the Older is not fruiting well it will be well to try the Cumberland.

MR. CLEMONS: I would like Mr. Caulkins' experience with the dewberry. He has had success.

MR. CAULKINS: Success for one year. I am testing the dewberry in a small way in the orchard where the shade of the apple tree and the windbreak on the west will protect it. Cover with straw the same as strawberries. We pick with leather mitten on one hand and a glove on the other and pick whole handfulls by lifting the vines. I grow Lucretia, Bartel, and Salzer's Mammoth; the latter gives largest berries. Trim in the spring, cutting off all the branches to three feet.

MR. GREENE: The Lucretia has been grown in Scott county for many years. It is cultivated in rows and trellised.

MR. PRICE: Sixteen years ago I planted 1,000 Lucretia vines, covered several years the same as strawberries and grew large crops. But as the years went by I found I had a big weed patch and lately I have tried to get rid of them by plowing, but the more I plow the more dewberries I have. They should be kept in rows, cultivated and trellised as Mr. Greene suggests.

MR. WRAGG: Is it a fact, Mr. Greene, that a leaf-eating insect has come into our state which must be looked after if we raise any strawberries.

MR. GREENE: The longer fruit is grown in any section the larger the number of diseases to combat. The fruit of young orchards in new sections usually are perfect because the insects

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have not come. To prevent these ravages we must begin a systematic warfare. The strawberry has many insect enemies. There are more than 100 species of insects which attack our fruits. We must spray with a poison which will kill those which eat the foliage and with kerosene emulsion those which suck the juices from plants. The bordeaux mixture and Paris green, or London purple, or arsenic we apply together to destroy insects and fungus diseases. On the strawberry it is best to apply the year before the beds come into bearing. To grow fruit successfully we must prepare ourselves to fight these enemies. When a patch gets infested with anthracnose it is best to plow the patch and begin again.

JUNEBERRIES.

BY H. L. FELTER, WASHTA.

The juneberry seems to be entirely at home in northwestern Iowa. It is one of the earliest fruits to blossom in the spring and is a mass of white bloom so early that you would fear that spring frost would ruin the crop, but not so, for the fruit will come no matter how severe the frost or unfavorable the location. I have had other kinds of small fruits damaged by late spring frosts but the juneberry bears a full crop always. A hedge row of dwarf juneberries in full bloom is a grand sight and when loaded to the ground with pink and purple berries it looks profitable and attractive; again, compared with raspberries and blackberries most people would say that juneberries were not so good, but for canning and making pies they are very good and the fresh fruit sells well in a retail way, and they seem to satisfy the customers. The bushes are hardy and productive every year, while raspberries are so uncertain that many have abandoned them entirely. Let the reliable juneberry take their place. As to varieties the dwarf Alpine suits me best of three kinds, but the Success is said to be still better and superior to all others. They are propagated by sprouts, or suckers, which is a slow method and we get poorly rooted plants. For this reason they are not popular with nurserymen.

MR. WRAGG: There is a greater work in the development of the juneberry than of the sandcherry. There is one on the experiment grounds called the Gardner; they furnish plenty of bird fruit, but we get lots of berries and enjoy them. In the north there is a place for the juneberry.

MR. PRICE: I have had the juneberry for 18 years. I value it very highly, good to eat and sells well. I heartily recommend it.

MR. BURNAP: I think the recommendation should be with a caution. I had a large patch, it was absolutely worthless because of the variety.

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MR. KINNE: The juneberry is very hardy and sure fruiter but very tedious to pick. It is worth growing simply as a lawn plant as it is ornamental.

WEDNESDAY AFTERNOON.

SOME VARIED FRUIT TOPICS.

BY J. L. BUDD, AMES.

I am requested to send a paper for coming meeting under the heading of "Late Notes on Russian Fruits." Such a paper could only prove useful by copying a few dozen reports from those who have fruited Russian varieties in the North in a small way, such as are given in Bulletin No. 41 of the Iowa Agricultural College. At this time it occurs to my mind to direct attention to the need of hardy roots for our hardy varieties of fruits, and add some notes on the marketing of northern apples, and on the latest keeping Russian varieties.

Hardy Cherry Stocks.—The Russian cherries sent us from Ames in a small way for trial have been worked on three classes of roots. A part were budded on Mahaleb roots, a part were crown grafted on Mazzard roots, using a long scion set down to the top bud in nursery, and a part were budded on Red Wild Cherry (*Prunus Pennsylvanica*) stocks one year old from the pit. The outcome as gathered from very many reports is truly suggestive. Those budded on Mahaleb stocks at the ground have been mostly root killed by the open winter of 1898–9. Those of the same varieties crown-grafted on Mazzard and set deep in nursery, and still deeper in orchard, have mainly lived, but in most cases were set back in growth and fruiting. Those budded on wild cherry stocks in all cases have not only lived but have suffered no check in growth or fruiting. In other parts of the country a much larger experience has demonstrated that trees on this root have lived longer, grown thriftier, and have borne heavier crops than the same varieties on commercial roots. As instances at Tyrone, Pennsylvania, the use of this stock was commenced twenty-five years ago and we have the report that all classes of cherries take well on it and make a good union, and that the trees live longer, are thriftier, and bear heavier crops than the same sorts on common roots. In Nova Scotia, Canada, Professor Craig reports an old cherry orchard of two thousand trees on this root that shows that same increased longevity, vigor, and heavy bearing. Again, at the experimental farm at Ottawa, Canada, Professor Magoun reports that about all the cherry trees on commercial roots had been root killed while the same varieties on wild cherry stocks were perfect and bearing heavy crops. If needed the writer can give whole pages of such long experience some of it in Benton county, Iowa. These notes are given with the hope that some enterprising northern nurseryman will visit the hills near Deadwood, South Dakota, the last week of June, 1901, to gather wild red cherries by the bushel or fifty bushels. The time is opportune; if grown by the hundred thousand they would now find a market.

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Hardy Apple Roots.—The Duchess and other very hardy Russian apples are now grown at the North in such quantity that seeds, at least for northern use, could easily be saved. It is very probable that seedlings of the cherry crab will be used in the Dakotas, but we now know that seedlings of Duche s, Anisovka, Anis, and many other varieties, are hardy enough on the drift soils of northern Iowa, especially if root grafted in the usual way. Who will lead this work in the north?

Hardy Plum Roots.—Fortunately the use of our native plum roots for budding and grafting is now well established in the West. But our amateur fruit growers buy plum trees by the ten thousand grown at Huntsville, Alabama, or at other places, budded on Marianna, Myrobolan, or St. Julian stocks. The varieties are often all right, but the winter of 1898-9 showed the roots were all wrong. Buy your plum trees at the home nurseries and be sure they are on native plum roots or budded on dwarf Mountain cherry (*Prunus Pumilla*) stocks.

Shipping Apples in Boxes.—Those who grow apples in northern Iowa need not be told, that they now have many varieties of good sized handsome, smooth, scabless apples, that ripen in autumn or early winter. Marketed in barrels these fine varieties will not sell profitably in competition with barreled apples of known varieties from Michigan, New York, and even Vermont. But shipped in half bushel or bushel crates, such as growers in Colorado and Utah use for shipping eastward their Bellflowers, they would find profitable markets in any of our western villages and cities. The writer has sold Duchess apples, picked when hard, in half bushel crates with lath sides, at eighty cents per bushel in Cedar Rapids, Iowa, when those coming in the old barrels and improvised boxes would not sell at any price.

Some late keeping Russian Apples. In Southwestern Iowa and the Ozark region, such so called, winter apples as Grimes, Jonathan, Fulton, Rome Beauty, and indeed all the best tender fleshed varieties, will become mellow on the trees if left unpicked to the time when Willow and Rawles Janet are mature enough to pick. If treated in all respects as Jonathan is managed in Missouri, we have a number of Ironclad winter apples in the north. As instances of little known varieties, B. F. Stoddard, of Jessup, reports of the Green Crimean (No. 399) "the apple is a fine keeper and the trees are heavy bearers on alternate years and have proven ironclad." This is as large as McMahon, conical, yellow when mature, and good in quality. M. D. L. Parsons, of Algona, reports that the Cross (15m) keeps well into winter. Clarence Wedge, of Albert Lee, Minnesota, reports the Repka Malenka as "a keeper and excellent variety in every way." Charles Luedloff, of Cologne, Minnesota, says of Zuzoff Winter, "a fine bearer and a large noble fruit that keeps quite well. Regal is also a good bearer, a good keeper and a good apple." E. R. Heisz, of Nora Springs, reports the Boydanoff as hardier than Wealthy with large handsome fruit that seems to be a pretty fair keeper. Henry Friddley, of Mineral Ridge, reports Winter Streifling, "worth all the expense you have had in testing new fruits. It is a fairly good keeper and a treasure with us." E. E. Brown, of Onslow, reports the Gros Mogul, "large, handsome, good in quality and keeps well into winter." T. S. Hauley, of Garwin, Iowa, reports Varonesh Cross "a good bearer of good quality and keeps into winter." P. J. Huber, of Fort Atkinson, Iowa, reports "Aport (23m) is a heavy bearer of large handsome good apples that

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keep a month later than Wealthy." Silas G. Goss, of Lehigh, reports, "English Pippin (No. 587) is a great bearer of fine grained good fruit. It is larger and better than Longfield and keeps longer" (note) A. F. Collman, of Corning, in southern Iowa reports English Pippin as good a keeper as Grimes Golden and about as good in quality. W. H. Guilford, of Dubuque, reports, "Repka Aport as a heavy bearer of large handsome fruit that keeps later than the Hibernal." We have many such reports also of the keeping of Crimea (Bog) Bogdanoff White, Red Queen, Varonesh Arabka, Varonesh Rosy, Good Peasant (31m), Lead (3m), Boiken and Winter Aport, but in case of some of the Aports, Bogdanoff White, Crimea, and some other handsome and good varieties, the reports came from those who pick early and are able to keep Fameuse and Wealthy into winter without material loss. The real value of some of these varieties and of such Russian seedlings as Red Warrior, Patten's Greening, Wealthy and other fine northern apples proving very hardy will not be known until they are grown by the barrel and handled as they handle Jonathan in the southwest.

MR. CLEMMONS: Several of the varieties mentioned by Prof. Budd in his paper are here on exhibition.

MR. HATFIELD: About handling apples in boxes. I have done this for some time and find it quite satisfactory both to myself and customers. The boxes hold half a bushel and cost five cents knocked down at the factory in Clinton.

AN OBJECT LESSON IN EVERGREEN GROWING.

BY M. J. WRAGG, WAUKEE.

Evergreen growing in the northwest is looked upon with distrust by many people. They say evergreens are not adapted to this region because nature did not plant them here. Perhaps, they have procured trees of the irresponsible traveling man which have proved failures and this experience has only brought confirmation to oheir opinion. I was born and reared on the prairie and have grown evergreens by the million, have sold them every where in the state with the result of their being a "joy forever" to the purchaser. We must impress our farmers with the fact that evergreens can be grown as easily and as quickly as the cottonwood if certain conditions are observed and complied with, chief of which are, never allow the roots to dry and plant firmly. Some of the evergreens are indigenous to many parts of our state. There is no doubt according to the weather reports, that the climatic conditions of Iowa have changed to a marked degree within the last ten years and this happy change is largely due to the planting of groves. And where evergreens are planted the change is most marked. Twenty-five years ago we never thought of a robin or a thrush stopping with us through the winter, but now they make their home with us the year round. The great question now is what shall we plant? Most of lists given in catalogues are misleading. In this part of the state you cannot grow the kinds that can be grown in Scott or Polk counties because the altitude, the rainfall,

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etc. are so much different. You cannot plant Norway Spruce with any expectation of long life for it. White pine will not do because you are not far enough north; it will do with us in Dallas county, because our soil is loose, retentive and near the water. You must get a tree that has like conditions in its native home. I know of no better pine for this section than the Austrian, the conditions in Austria are very similar to those of northwestern Iowa, high altitude, dry and windy and sudden climatic changes. Where ever I have seen them in the north they are models of beauty. Two years ago I made a trip to investigate them where they had been planted by Northwestern Railway along its line. Scotch pine was showing decay after twenty-one years from planting, but the Austrian planted at the same time showed perfect conditions. We want to plant evergreens not only for the present but for the future, trees that will be models of beauty a hundred years from now. We have west of us in South Dakota like climatic conditions and trees brought from there thrive all over northwestern Iowa. Then why not plant them? They have all the inherent qualities necessary for successful growth. We can plant Scotch pine with safety, but we must know where the seed came from. Seed brought from France is of little value, nearly as tender as Oleander. They have been grown for generations under most favorable conditions. Often you will see in the papers an offer to send several hundred evergreens for a dollar. If you have any notion to buy I give you Puck's famous advice to a correspondent about getting married, "Don't." It is folly to plant seedling evergreens on the prairie. Here are specimens of one, two or three year olds, you see how small they are; how long must one wait for a grove if they are such slow growers you say? Never plant anything except a transplanted tree. Here is a White pine; four years old, transplanted at two years, look at the root system. While these trees are slow at the start they soon begin growing rapidly and many of the pines will make an average annual growth of two feet. Here is a Black Hills Spruce which may be planted with safety all over northern Iowa. Here is the pine to plant here, the Austrain, if you plant this you will have groves not only for yourselves but also for your children and your children's children. in getting trees be sure to know where the grower got the seeds. We must look to it where the seed of any plant comes from; it would be folly to plant Boxelder seed brought from Texas, but the seed must come from our own trees. There was much rootkilling of evergreens in 1898-99; White pine showed decay and died last summer in Cherokee and other counties. Many sent specimens to Ames thinking it was due to the working of some insect. They were rootkilled by the drouth and then finished by the winter. The Colorado Spruce has been developed under most adverse circumstrances and when brought here it is perfectly at home. While a slow grower at first it becomes a model of beauty and a joy forever. The early stages of pioneer days are gone in northwest Iowa, and with them have gone the days of the willow and the cottonwood. Land is rapidly advancing in value and space must be economized in making permanent improvements. We build no longer for the day but for the future and in no way can we farmers of Iowa add to the material comfort and value of our homes than by the judicious planting of evergreens.

MR. KINNE: Do you recommend more than one transplanting?

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MR. WRAGG: Yes; twice is better, but the second is simply root pruning.

MR. BENNETT: How about the Arbor Vitaes?

MR. WRAGG: It is indigenous to very moist soil and the conditions are not favorable here.

MR. BENNETT: How about the Hemlock?

MR. WRAGG: It is hard to establish here; we must first form forest conditions, then it will do well; we have them thirty feet high at home.

MR. PEDDIE: Do you recommend planting potatoes or oats with evergreens?

MR. WRAGG, No; though of course they would tend to retain moisture. Cultivation is what is wanted; give evergreens as good conditions as corn.

MR. PEDDIE: Would you put them among other trees?

MR. WRAGG: No; unless planted at the same time; and even then it is not best, as the evergreens for the first few years will be robbed of moisture by the more rapid growing deciduous trees.

MR. PEDDIE: What varieties do you recommend for Palo Alto county?

MR. WRAGG: White Spruce, White Pine and Austrian Pine.

MR. PEDDIE: What about the Douglas Spruce?

MR. WRAGG: It is a cross between the spruce and the hemlock; it is a very beautiful hemlock, but I do not recommend it because of its scarcity. You will find it only in collections and arboreta, but the Colorado Blue Spruce is the noblest of them all.

MR. BURNAP: I wish to emphasize what Mr. Wragg has said of the Austrian Pine. It is really the only evergreen that has stood everything; but it is hard to sell as it is so brown in the spring.

MR. WRAGG: After ten years it gets over that; but most people go by sight. Many plant too large trees. The breathing apparatus of an evergreen is always in working order, and no tree will stand cutting back as much as the evergreen. When two or three feet high if you were to cut the top off completely it would be the best thing you could do, as it will then make a thick symmetrical top. This was done at the agricultural college twenty years ago, and to-day they are the finest trees on the campus.

MR. FELTER: What should we plant on low, moist ground?

MR. WRAGG: White Spruce, Norway Spruce and Arbor Vitæ.

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MR. CHAPMAN: What varieties of evergreens do you recommend the average farmer of northwest Iowa to plant for protection, and what distance apart would you plant them, giving general arrangements?

MR. WRAGG: This is one of the questions that is much easier asked than answered, as soil exposure, altitude, etc., has much to do with evergreens in northwest Iowa. My observation leads me to believe that for the ordinary farmer who is located west of the Des Moines river and north of a line running between Woodbury and Monona counties east and west which is practically taking in the northwest corner of the state. That among the pines the Austrian and the long leafed pine, known as Pondorosa, are the best two varieties to plant on high, dry, elevated exposure. Amongst the spruces the White is undoubtedly the best and the variety known as Black Hill spruce is certainly to be preferred to the White spruce from the lake regions. We are confident that the White spruce, Bull pine, and Austrian pine will be found the best three trees to plant for wind break protection over this section of the state. In location where there is an abundance of water close to the surface and where trees are not affected by drouth, then plant the White pine and Scotch pine. I am confident that for general planting purposes that the White pine is our best pine but must have an abundance of water at its roots to insure health and longevity of tree.

As to general arrangement I certainly think that the wind breaks about the home and barns should be planted in rows, planting the trees in the row about sixteen feet apart and the rows at least sixteen feet apart. By alternating the planting or breaking joints as it is called, you will by the planting of two rows in a few years have such a wind break that will be a complete barrier against the wind and storm. I am quite certain that the Austrian pine is not as well known as it should be among our tree planters. While it is a foreign variety, yet the conditions in northwest Iowa are such that where-ever specimens of this tree are seen growing they are perfect models of health and vigor.

MR. CHAPMAN: What varieties of evergreens would you plant on the lawn?

MR. WRAGG: I should always have a specimen of the Colorado Blue spruce even if I had to go to to the Rocky mountains for it. It is a tree that when once seen is always admired for its beauty of foliage as well as the graceful and symmetrical arrangement

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of it branches. For yard trees one is safe in recommending the following list:

Colorado Blue spruce, Concolor fir, White spruce and Balsam fir.

MR. WINSET: I am not a fruitman but have a little orchard. I was the pioneer in fruit growing in Clay county and have had very good success. Everybody said I was foolish to waste time and money on apple trees eighteen years ago, but I have been rewarded for all my trouble many times over. I first set Duchess, Wealthy, Whitney No. 20, and Walbridge; all these did well except the Walbridge; the winter of '98-9, so disabled this variety that the trees are now worthless. Later I set other varieties, such as Harry Kaump, Pewaukee, etc., but they went out the same winter. Have set many plums and have had great success with them. As to windbreak, I set trees for windbreak at the same time I set the orchard, and I believe that is the best plan as the fruit trees are in this way less liable to sunscald. Whenever orchards have not had protection, I have noticed the fruit is badly blown off, while mine is not. I protected my young trees on the Southwest with a board or stick, and this keeps the sap from starting in February and March. I now wrap the trees in the fall with cornstalks, which keep off the rabbits and answer for protection in the spring. As to varieties of apples for Clay county, if I were to set out 1,000 trees 990 of them would be Wealthy.

MR. CLEMONS: What about the other trees?

MR. WINSET: A few Duchess, but it does not bear as well as the Wealthy.

MR. CLEMONS: Down in the Northeastern Society they recommend setting Virginia crab and top-working it. Perhaps it would be well to set a few and top-work Ben Davis and other semi-hardy varieties and have less Wealthy.

MR. CHAPMAN: Mr. J. S. Trigg, of Rockford, who is unable to be with us because of a previous engagement with the Minnesota Society, writes: "Tell your fruitmen to top-graft Northwest Greening, Ben Davis, and other desirable varieties on Virginia crab, cultivate thoroughly, mulch heavily, and keep the cows and the blue-grass out of the orchard."

MR. HATFIELD: My orchard has had good protection on the south but none on the other sides.

MR. TIPP: I planted an orchard near here twenty years ago, and, like Mr. Winset, set a wind-break at the same time but left the north open. The trees have done well—mostly Duchess and Wealthy, but have almost everything that will grow here.

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MR. CHAPMAN: Mr. Van Houten delights in saying that the best protection for an apple tree is another apple tree, and I don't believe that can be improved upon.

PERMANENT IMPROVEMENT.

BY H. N. ANTISDEL, FORTORIA.

In the early days when the sturdy pioneers were taking up homesteads on the north western Iowa prairies, cottonwood and willows were about the only trees used in planting his grove to protect his new home against the northwest blizzard. Now since we have had a few dry seasons the willows are nearly all dead and the cottonwoods are going down with every hard wind, dead and decayed, and the timber worthless, not even good firewood. It now looks very much as though the red cedar for windbreaks and the elm for shade trees are permanent improvements. If many of the highways that are now growing to weeds four to six feet high, (and some of them unmowed) were seeded to blue grass it would be a permanent improvement to this country. In this do not think that I am saying that the fruit grower is a lover of blue grass, for I, at least, find it meaner than pursley. But can it be that the farmer lets the weeds grow along his road-sides rather than blue grass for fear it might get among his currant bushes? There is a marked improvement in the variety of frut grown now and the methods used.

I think that our Iowa horticultural paper, the *Fruitman*, for which we have had to sacrifice a good fruit grower, and our horticultural societies are one and all permanent improvements. I have found that spraying for the plum curculio and gougers is a permanent improvement from a financial standpoint. The Albany Wilson strawberry was considered a grand, good berry in its day, but now we have a permanent improvement over it in the Crescent, the Bederwood, or the Warfield, with many newer sorts now claiming the same position over them, and if I mistake not some are justly meriting the honors. Look for instance at that king of fruit, the Iowa apple. There are many varietles that are here to stay, that are permanent, among them are such as the Duchess, Wealthy, Hibernal, Whitney No. 20 and others. And there are a host of new seedlings of which a few are promising, but who can say with authority that they are a permanent improvement. There are many new fruits that look like a success at present but are they to stay, are they safe for us to tie to, are they an improvement that will be permanent?

MR, HATFIELD: Mr. Antisdel has a knock at the cottonwood. I wish to defend it. We have a saw mill near me working on a row of cottonwood half a mile long. It has cut 50,000 feet and has 25,000 more to cut. I have let a contract to cut 30,000 feet on a half mile row, and the sawyer says I will have 20,000 feet left. This row has taken three acres of land, the lumber sells at $20 a thousand feet. Suppose the whole quarter section had been

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set to cottonwood? There is a good demand for the lumber when sawed into dimension stuff. It is much better than pine, lasts as well, is stronger and holds a nail better. Set in rows the tops of the trees will not decay.

MR. CLEMONS: If I had a moist soil I would set Catalpa in preference to Cottonwood.

MR CAULKINS: Our Larch is better than either; a rapid grower, a beautiful tree and makes good fence posts.

MR. BURNAP: The American Larch grows in low, moist ground, while the habitat of the European Larch is on high ground. The latter will do much the best here.

MR. CAULKINS: On my father's farm in Chickasaw county there are 100 American Larch, 22 years old, from 12 to 15 inches thick at the butt.

MR. KINNE: On my place there is little difference in growth between the Catalpa and the Larch; each gives about the same number of posts after twenty years growth.

MR. BENNETT: How many years for a Catalpa to grow five posts?

MR. KINNE: About twenty years.

MR. BURNAP: I doubt if our President would find a Catalpa twelve feet high from here to McGregor. My Larch planted at the same time are three times as high as the Catalpa.

MR. CLEMONS: I presume many of those who have not been successful in growing Catalpa for posts have grown them singly. They should be set in groves.

MR. KINNE: Mine are set corn fashion, 3 feet 8 inches apart each way.

MR. BENNETT: There is in this county a Catalpa grove of 4 acres which, eight years ago was a fine grove, trees eight feet high, eight foot rows and eight feet in the row, none of them now are ten feet high. There is a grove here in town which looked fine a few years ago, but now nearly all are dead.

MR. ANTISDEL: In our district I don't think you can find a Catalpa over ten feet high. It seems to me some of us ought to have struck the hardy kind, as we got them from various sources.

MR. IRWIN: The Siberian is one of the new varieties of Larch. It is being propagated by the government, and many reports from extended testing show it to be hardier than either the American or the European. Such at least are the indications.

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MR. BURNAP: I brought Larch into northern Iowa twenty-five years ago. The American has not done well, but the European has given satisfactory results in nearly every instance.

MR. KINNE: You remember the point made by Mr. Wragg in regard to where the seeds come from. The originator of the hardy Catalpa lived in Dayton, Ohio, and it was from there I got the seeds for my first planting. I have from that planting posts set twelve years, and were cut green. We took them up last fall, and they were perfectly sound. Later I sent to Missouri for seeds and got three varieties; the seed of the hardy variety was very much like that described here to-day. Too much care cannot be taken in the matter.

WEDNESDAY EVENING.

This session was given up to an address on "The Farmer and his Education," by Dr. Reed, president of Buena Vesta College, Storm Lake. The address was listened to with interest and delight by the members of the society and many of the people of Emmetsburg.

THURSDAY MORNING.

The committee to award prizes for best essay by boy or girl on subject of "Why Plant Trees?" reported through the chairman, Mr. Erwin. First, Ryle P. Teed, Ruthven; second, May De Groff, Ruthven; third, Carl Helgen, Ruthven. Twenty-two papers in all were entered in competition. The first prize was seeds or plants to the value of $2.00; the second, Prof. Bailey's "Principles of Fruit Growing;" the third, one year's subscription to the *Fruitman*.

Committee on fruit exhibit reported through the chairman, Mr. Burnap, as follows:

Your committee upon premium awards desire to report as follows:

For best collectian of named apples grown in one county of Northern District—

W. N. Antisdel.....$10.00

For best collection of named apples and crabs grown by exhibitor in Northern District—

First—C. D. Price.....$ 7.00

Second—A. W. Hatfield..... 5.00

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For best collection of seedling apples grown by exhibitor in Northern District—

W. N. Antisdel.....$ 3.00

For best plate of apples named in the premium list—

Kaump, H. L. Felter.....$ .50
Haas, C. D. Price..... .50
Walbridge, A. W. Hatfield..... .50
Longfield, C. D. Price..... .50
Fameuse, C. D. Price..... .50
Iowa Blush, A. W. Hatfield..... .50
Wealthy, C. D. Price..... .50
Ben Davis, A. W. Hatfield..... .50

For best plates of varieties thought worthy of cultivation not included in named list—

Romna, L. A. Clemons.....$ .25
Plumb Cider, A. W. Hatfield..... .25

Your committee further report that they found some fine seedling apples in the displays of H. N. Antisdel, C. D. Price and A. W. Hatfield; also a fine display of apples by C. S. Duncan and other parties unknown to us, all of which added much to the value and beauty of the very creditable display here made, but not having been entered could not be noticed by us in the distribution of awards.

Respectfully submitted,

W. A. BURNAP,
W. GREENE,
J. C. BING.

The committee to examine books of the treasurer reported through the chairman, Mr. Caulkins, as follows:

Your committee on treasurer's report has examined the treasurer's book with vouchers for disbursements and find them correct according to report.

A. S. CAULKINS,
A. W. HATFIELD,
H. L. FELTER.

WORKING AND WAITING IN NORTHEAST IOWA.

BY W. A. BURNAP, CLEAR LAKE.

Of horticultural working and waiting, we old northeast Iowa veterans of a passing generation, have had more than enough. We have seen many a hope joyfully heralded at birth and carefully nurs.d into bloom, then carried triumpantly to full fruition, or deposited sorrowfully in the grave of utter failure. The road that marks what progress we have made on our horticultural way, is thickly marked by the graves where lie our buried expectations. Many of our number have either fallen by the wayside or been captured by the enemy, but the "Old Guard" still remains, who having learned wisdom from experience, fortitude from failure, and success from disaster are yet holding the front of battle where you in northwest Iowa

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have with us "lined up" and where together we will, God willing, win for our beloved state a grand horticultural victory. The fruit conditions with us are exceedingly varied. They differ from the wooded bluffs of the "Switzerland of Iowa" along the Mississippi river, to the bleak level prairies of the central part of the state, and every condition between these wide extremes is fully presented, The roots of the orchards about Mc Gregor, hunting for food, must force their way amid the openings and crevices of the Azoic rocks of the Silurian age, while those planted on the west line of my district grow unobstructed through the clays, sands, and deeply burried cedar trees, of a geological recent Wisconsin drift.

With all these varied conditions, difference of opinions, experiences and results, must naturally occur among us. To make any other presentation of facts would convict me, without argument, of either ignorance or dishonesty. With varying results we have worked along every line of horticulture that has promised any successful results. We have planted crabs and hybrids, and Russians, and old standard apples and new seedlings. We have root grafted and budded, we have top-worked on crab and standards, in the trunk and on the branches. We have worked in every way and every manner that ingenuity could devise and our pocketbooks maintain and have waited and are patiently or impatiently waiting for results. Much of this work has necessarily been lost, but many results still remain to reward us for past labors. and give earnest of future greater and better things to come. Of the older varieties that we have tried and not found wanting are Duchess, Wealthy, Tetofsky and Whitney have been proved and will do well all over the district, while Longfield Fameuse, Walbridge, Malinda, Plumb Cider, Northwestern Greening, Hibernal and Kaump succeed bountifully on favored locations.

It is in the line of propagating new seedlings and originating new varieties that we feel the greatest satisfaction. Of all the state of Iowa it was with us that this idea took first and deepest root and has reached its highest fruition. The Gardners, of Osage, and the Ferrises, of Hampton, both have, I understand, some good things coming which for prudential reasons they are not ready to announce. W. H. Guilford, of Dubuque, has at least four new plums of his own origination, that will prove valuable, and many seedlings of Japan Hybrid No. 2 from which may be expected, perhaps, surprising results. G. A. Ivins of Iowa Falls, has originated at least four varieties of apples, fifteen of strawberries, and many plums which are promising fine things for the future. J. B. Mitchell, of Cresco, has many new apples of his own, some of which have been tested long enough to prove their value and desirability for our part of the state, notably among these last are, Michell's Red Warrior, Cresco, No. 4 A, Ness, Lawrence and Quince. Last but not least C. G. Patten, of Charles City, has been the father of us all along this line. We of northeastern Iowa have long thought that this member of our society had done more for the horticulture of north Iowa than the whole college of Ames with its costly equipment, and I understand that Professor Craig of that school after examining Mr. Patten's grounds frankly plead "guilty" to the indictment. Pattens Greening, upon its merits has spread all over north Iowa, Wisconsin, Minnesota and crawled down the Red River of the North as far as Crookston where it stands in a temperature of minus 60°. This is only one and I believe not the best one of his many

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seedlings, Patten Fameuse, Brilliant, B. D. Sweet, Duchess No. 8, Iowa Beauty, University, No. 102 and many others have a future before them that will honor their originator and be of great and lasting benefit to this northern country at large. What working and waiting has done in the past it can do even better in the future, and with our two societies now joined shoulder to shoulder in common cause, for a common purpose, who dare predict what great results may come, nor how soon the glorious horticultural future that is surely on the way to bless us, may knock at our door, graciously enter at our bidding and then remain to abide with us forever.

MR. KINNE: Do you put Patten's Greening before the Wealthy?

MR. BURNAP: Where Wealthy will do it will not pay to grow Patten, but the truth is, Wealthy is not hardy and where it begins to fail the Patten fills the bill. Patten's Fameuse No. 1 is a most excellent apple, better, I think, than Patten's Greening. The Brilliant, I believe, has a great future; its season is not yet definitely fixed. The Iowa Beauty is one of the most magnificent trees I ever saw but the trouble is it is only another one of our summer apples. It may be valuable for top-working.

MR. ERWIN: I agree thoroughly with what Mr. Burnap says in regard to seedling work among private parties.

SPRAYING.

BY A. T. ERWIN, AMES.

I may say at the outset that I shall not attempt to throw any new light upon this subject; but there are always beginners present who are taking up this work for the first time and to these I shall address myself.

First of all let us inquire why it is necessary to spray. Some good, gray haired brother says, "this spray business is all foolishness, when I was a boy we did not have apple scab, canker worm, etc. We had good fruit without spraying then, why can't we have it now?" There are various reasons why we can not. We must recognize that many conditions are essentially different from those when you were a boy. In nature there is a constant balancing up, or equilibrum which is maintained with considerable vigor, or according to the old poem:

"A flea has smaller fleas that on him prey,
And these have smaller still to bite em,
And so proceed ad infinitum."

In nature as many of these insect pests become abundant, some enemy appears and destroys them, it in turn perishes through lack of a host to prey upon and so the battle goes on. But under domestication many of these natural conditions are departed from more and more. As a result a work

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which mother nature attended to when unmolested, must now be done by man. Certainly we have gained sufficient in return to justify the extra labor on our part.

We have two general classes of sprays, fungicides and insecticides.

I shall only mention these, for detailed formula, consult the spraying calendar published by the Experiment Station, which is sent free to all applicants. Of the fungicides, bordeaux mixture is the familiar example.

In spraying for insects we must be governed by the feeding habits of the insect we wish to combat. For insects which feed by sucking the sap, such as the green fly or aphis, squash bug, etc., arsenical poisons would be totally ineffective. Hence, we must apply a spray which will kill by external contact, such as kerosene mixture, pyrethrum and tobacco. For the biting insects we use an arsenical poison, such as Paris green or London purple. The former, however, is to be preferred as the London purple varies considerably in its strength and chemical formula, and hence is not sufficiently stable to be relied upon. Many of these may be applied in the dry powder stage with a dust gun when the dew is on, or in a liquid mixture. Usually the latter gives the best results.

In applying any spray it is important to see that the work is well done and attended to at the proper stage. To reach the under side of the leaves of many plants is often difficult. With squashes we find that the use of an iron pipe with a curve near the nozzle is convenient. Insects have various stages of existance, as the larvae, pupae, etc., and are usually most destructive in the lavae or worm stage. We must study the habits of the insect we have to deal with, learn its most destructive stage, and also to combat it at its weakest point.

Spraying at the proper time is also important. If neglected our plants may be irrepairably checked, or at least a hard fight is necessary, whereas if attended to at an early stage the work would have been comparatively easy. Often spraying is discouraging work through the indifference of the community, which permits one or two thrifty growers to carry on the crusade by themselves. In this case it is exactly similar to the farmer who attempts to keep his field clean when his near neighbor has his fence corners full of weeds which are going to seed. To be thoroughly successful we must have general co-operation in the community and make an aggressive warfare from all sides upon these fungus and insect enemies.

MR. FELTER: How about dry insecticide?

MR. ERWIN: Its success is not yet established. One man uses dry lime with a pump which throws the lime a long distance. It may be all right for the aphis; the appliance is all right but is yet a question whether the dry lime will be effective.

MR. KINNE: Is spraying with lime in Missouri to retard fruit buds a success?

MR. ERWIN: Yes, to a large extent. If you wrap two thermometers with rags, one with white and the other with black the one wrapped with black will rise higher. At the Missouri experiment station this fact was made use of. Peach buds are injured

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by frost just as they begin to swell. A thick solution of lime, about like molasses, was made and three or four coats put on the tree in the fall and then in the spring when the warm days came it would keep the tree dormant seven or ten days later than those not coated and thus carry it over the late frosts. From that point it was a decided success, but the trouble is if the season is warm and wet late in the fall or early in the spring the application must be removed. An effort is now making to add something to the lime to give it consistence so that it will not wash off and yet not injure the tree.

MR. BURNAP: Do you consider that spraying has been reduced to an exact science, that is, would you take an orchard and so spray it with a reasonable certainty that you can carry it through successfully?

MR. ERWIN: I would say that those are phases that are yet in an experimental stage; but I could cite many specific cases where spraying has a positive effect. Take the aphis, it is not a question whether the kerosene emulsion will kill it, it is no longer a problem that the codling moth can be kept down by spraying. But there are problems in spraying, for example, Bordeaux mixture may be applied for rust in one locality and not do any injury, but in another it will burn the leaves. There are many such problems which are quite puzzling.

MR. ANTISDEL: Will spraying a healthy tree which drops its fruit be helpful? We have Wealthy which does this.

MR. ERWIN: Without knowing more of this instance I would say not. The object of spraying is for insects and fungi.

MR. BURNAP: To prevent apples dropping you want to treat the other end of the tree.

MR. FELTER: Is there any wash to keep away rabbits?

MR. ERWIN: I have had no satisfactory experience with any.

MR. PRICE: How about tar paper if taken away in March?

MR. ERWIN: I think it dangerous. Tar itself is destructive of plant life as it contains carbonic acid, etc. I know of one large young orchard where tar paper was used, the owner was slow in taking it off in the spring, bright warm days melted the tar which stuck to the trees and before the middle of summer every tree was dead. Tar is one of the best things we have to put around scarred tree, but it is first heated very highly which drives out the carbonic acid.

MR. BURNAP: For protecting from rabbits Mr. Haviland's method is good and that is ordinary wire screen wrapped about

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the tree. First build the mouse mound and then put on the screen, one will last as long as necessary. It protects from mice, etc., as well as rabbits and gives partial shade, perhaps all that is necessary.

THURSDAY AFTERNOON.

FRUIT FOR THE FARM.

BY L. A. CLEMONS, STORM LAKE.

The subject assigned to me, I presume, means fruit for the farmer and his family. This is a subject of much interest and importance, and one over which there has been a great amount of discussion and costly experimenting in many, and I may say, in a majority of cases, with profitable results. With apple trees, enough of them have been bought and set in Buena Vista county in the thirty or more years of its settlement to provide a small orchard on each quarter section within its limits. Yet for all these years of hoping and waiting, for all this expenditure of labor and money, we have very little to show for it to-day. These trees were bought mainly at from two to four times what they should have cost; mostly varieties wholly unsuited either in hardiness or adaptability to the surroundings of climate and soil, bought with hard-earned money on the recommendation of a tree agent, whose sole mission in the fruit business is to sell the trees on his list and obtain as many of your shekels in exchange for them as he can with fair promise and much smiling palaver, wheedle you out of. He probably leaves you to think he has done you a great personal favor and that you know all about the fruit business and are on the way to success; he then hies to greener fields. Alas, you will never see that smiling countenance again; never again sit at his feet and drink in his words of wisdom; another delivers the trees, often but dead sticks, or at best wholly lacking in the essentials that apple trees should have to make a successful orchard in northwestern Iowa. But the other fellow has your money and you are on the high road to acquire experience ending in a bursted enterprise. Says one, that is an old story, what remedy do you propose? Don't buy trees or shrubs of any kind from agents having no abiding place amongst you. If you can obtain what you want of a nurseryman in your vicinity buy of him; if he misrepresents things to you you have a chance to get back at him. I incline to the opinion that men engaged in the business and living in the same community with you, desire your success and feel a personal interest in your success with trees and plants sold to you; he will give you the benefit of his best judgment and experience which, in most cases, he has acquired by years of study and patient toil. When you have made up your bill go for the trees; see that they are properly dug and protected until set in your orchard; set well and carefully cultivate for a series of years; see they are well protected from stock and other destructive agencies. Should you be unable to procure at home what you want, send to some reliable nurseryman for catalogue and prices; as a rule you will get what you buy, and at reasonable prices.

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The above is intended to embrace and include all other kinds of fruit trees and plants. Now allow me to say right here that in making your selections put none but the hardiest on your list, don't select the varieties which you prized in your eastern home, long and costly experience has proven all of them wholly unsuited to the environments in western Iowa, this applies especially to the apple and domestica or tame plum. I hope my farmer friends will not give up trying to raise fruit because I have pointed out some discouraging things connected with the attempt, but strive always to make the undertaking a success.

Farmer friends, are you doing what you should to make your home surroundings pleasant, adorning the farm with trees and fruits and flowers? It is your intention to leave your farm a lovlier and more interesting spot on God's green earth than when it was taken from the hands of nature. A home that as your children grow up and pass out into the great world will love to talk of and return to. If you have not done these things, this winter is a good time to make your plans and selections of trees and plants and at least lay the foundation for a fruit plantation on your farm for yourself and family.

COMMERCIAL ORCHARDING.

BY B. SHONTZ, CORRECTIONVILLE.

Commercial orcharding, the subject assigned to me, is one that has been before the people for some time so that I cannot say much that will be new. A little of my own personal experience will be all that I can give. The first thing to do is to prepare the land. This should be done the year before planting by plowing it very deep and fertilizing the land. The next year it is ready for planting. I would buy two year old trees, well grown and branched and not over two and one half feet high. Mark it both ways and dig the holes large and eighteen inches deep. Dig them sixteen feet apart north and south and twenty-eight feet apart east and west. After the orchard is all planted mulch each tree with coarse manure three feet around the tree. Cultivate the orchard by planting it to sweet corn or potatoes the first year, and I should cultivate it for four or five years to such crops. Now the varieties of apples that I would plant in this part of Iowa in which I live (which is northwest Iowa) would differ perhaps, from the varieties used in other parts of the state. If I were to plant an orchard of forty acres I would plant twenty acres to Wealthy, five acres to Northwestern Greening, five acres to Duchess, eight acres to Plumb Cider and two acres to Yellow Transparent. These varieties are all hardy and are good bearers. In this section there is more money in those varieties than anything I have on my grounds. That is my personal experience. To have good trees you must give them good care. I wash my trees each year in the month of June with strong lye water and look for borers and other insects at the same time. In September I wash them again. Of course you must use a brush so that you can keep your hands out of the water. Prune your trees sparingly and only with the knife each year. Never let the limbs get so large that you have to use a saw in pruning, surplus branches should be removed while the tree is young so

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that other branches will get the full benefit of the sap. When the trees begins to bear I sow the ground with red clover. Let the crop go on the ground as mulch and to reseed the land. My experience is that an orchard kept in this way will pay better than any other crop or crops a man can grow in the same amount of ground.

MR. BURNAP: How free a bearer is the Northwestern Greening?

M. SHONTZ: Doesn't fruit till ten years old; bears light for two or three year and then heavily.

MR. DUNCAN: Do you consider Harry Kaump eligible to the list?

MR. SHONTZ: I left it out because it is small and mushy; it is hardy.

MR. DUNCAN: Isn't twenty-eight feet too far for the rows?

MR. SHONTZ: I have three orchards; one twenty-one, one twenty-seven, and the other twenty-eight feet by twenty feet, which I think the best. I have the same varieties in all settings. I put them twenty-eight feet so as to put six rows of corn between.

MR. CLEMONS: Is the corn more important than the orchards?

MR. SHONTZ: When the orchard is fifteen years old those who plant closer will be sorry.

MR. FELTER: I would set twelve by thirty-five feet.

MR. DUNCAN: I believe in close setting; will get much more fruit for many years when the orchard will begin to thin itself.

MR. SHONTZ: The trouble is it will not thin in the right places.

MR. BURNAP: Mr. Haviland of Ft. Dodge has 148 acres of orchard planted fifteen by thirty. He has no reason to change this plan,

MR. CLEMONS: How would it be with Tetofsky or other upright growing trees?

MR. BURNAP: They will stand closer planting. There is money in the Tetofsky for this section and I believe it has a future. Its season is about as long as the Duchess.

MR. KINNE: I once asked Mr. Elder, who is in the apple business in a commercial way, what was his most profitable apple and he said the Tetofsky.

MR. BURNAP: The only trouble is the trade is not acquainted with it. It ripens early and has no apple in competition with it. It is a fragrant apple. Set a box of them in the store and it will scent the whole room. They should be marketed in boxes. You will get about as many as of the Duchess if planted thick. I

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put my rows eight feet apart and sixteen feet in the row. It is nearly up with the Duchess in early fruiting; is a gross feeder; likes a low rich soil.

Mr. Felter introduced the following resolutions, which were adopted:

Resolved, That the thanks of this society are due and are hereby extended to the citizens of Emmetsburg and to the speakers, musicians and children who have assisted in making our stay in their city so pleasant and enjoyable.

Resolved, That the thanks of this convention be tendered to the papers of Emmetsburg for courtesies extended to this society.

After an exhaustive discussion the following resolution by Mr. Hatfield was adopted:

Resolved, That the Secretary be instructed to request fruit growers of the various counties of the district to send him a list of such varieties of fruit as they would recommend for their respective localities, and from these replies to prepare a tabulated list for publication in the report of the proceedings of this society.

On motion of Mr. Clemens the Secretary was further instructed to request correspondents to confine the recommended number of apples to five varieties.

THE ELECTION OF OFFICERS.

The following officers were elected for the coming year:

President, P. F. Kinne.....Storm Lake
Vice-President, J. C. Winset.....Fostoria
Treasurer, B. Shontz.....Correctionville
Secretary, W. B. Chapman.....Washta
Directors—H. N. Antisdel, L. A. Clemons, A. W. Hatfield, H. L. Felter, A. S. Caulkins.

On motion the location and date of next meeting were left to the decision of the executive committee.

FRUIT GROWING IN PALO ALTO COUNTY.

BY C. D. PRICE, RUTHVEN.

Small fruit growing in northwestern Iowa is no experiment except with new varieties. Any man with a small piece of ground can have his table supplied with small fruit from the earliest strawberry up to the first of October. We had fresh grapes in good condition on our table Thanksgiving day. The strawberry is the first fruit of the season and coming at a time when old fruit is gone makes it especially more desirable, and it is the

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most popular of all the small fruits. The growing of this fruit is the simplest of them all, thriving as it does on any soil that will grow good corn. The ground should be thoroughly prepared before planting. Set the plants with the crown even with the top of the ground with the earth pressed firmly around the crown of the roots with thumb and finger. For field culture the rows should be three and one-half to four feet apart, plants should be twelve to eighteen inches apart in the row. Let the runners grow and form a matted row eighteen inches or two feet in width. For garden where no horse is used the rows should be two feet apart and twelve to fourteen inches in row. As soon as the ground freezes cover lightly with hay, or straw, leaving enough in the spring so the plants can come up readily and to keep the fruit clean. Do not rely upon a bed longer than three years, have young bed coming on and plow up the old one.

Raspberries are too much neglected and are one of the best small fruits. I plant the blackcap varieties three feet in the rows and seven feet between the rows. If tips are used they should not be set too deep. Pinch off the tips of the canes when about one foot high the first season and after the first year when from two and one-half to three and one-half feet high. The red varieties that sucker can be planted two feet in rows and seven feet between rows and allowed to form hedge rows, or they can be planted four by four feet and kept in hills and cultivated both ways.

Blackberries and dewberries are not hardy and will have to be covered, if not protected they will kill to the snow line every cold winter. The Snyder is the best for the north part of the state.

Currants are all hardy and easily raised. Plant four by five feet.

Choose a southern slope if possible for the vineyard, rows running north and south, I set my grape vines eight by ten feet, the holes were dug sixteen or eighteen inches deep and two feet in diameter for two year old plants. When ready to plant trim the roots back to a length of ten inches and cut the tops back to three or four eyes above the crown of the plant. Spread out the roots in a natural position at the bottom of the hole, press the earth quite firmly on the roots and fill up with earth so as to have the upper buds two inches above the surface. As the plants attain growth gradually fill up until the surface becomes level.

Select a northern slope if possible for your orchard. The trees should not be planted too far a part, 15 by 30 feet is about the right distance. All considered I would prefer three year old trees. The top should not be formed higher than two or two and one half feet, the branches will then protect the stem of the trees, and there will be less complaint of sun-scald, and the trees will bear younger and be more productive. They should be set from 2 to 3 inches deeper than they stood in the nursery, depending on the character of the soil; they stand drouth better and are not so much swayed by the wind. Lean and set heaviest side of top toward the 1 o'clock sun; mulch with some kind of coarse litter; as soon as the work is done sow to buckwheat or plant to corn for at least 4 years, then sow to clover and keep the trees mulched.

When I came to Palo Alto county in 1876 I found but few orchards and very few trees had come into bearing. The people thought that we could not grow small fruit plants that would be healthy and profitable, the standard variety of the apple would not endure this climate and be productive.

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Now our prairies are dotted with orchards. To pick 700 or 800 quarts of strawberries in a day or see a wagon load of apples on the market for sale is no more a novelty. It is hard matter to find a man that will say that we cannot grow fruit in the north part of the state with a handsome profit and of the best quality. We have varieties of the apple that seems to be as hardy as the oak and as productive as any variety I have ever seen fruiting in western New York. It is true we cannot grow the same varieties, but there are plenty of other varieties that are hardy and the fruit is of good quality. The Tetofsky and Yellow Transparent are early apples in northern Iowa and are ripe and gone before the Duchess is ready for the market. There is now a long list of hardy autumn varieties to select from. What we need is more winter varieties, there is quite a number that will keep to December 1st. The Walbridge is the only old standard variety I know of that will keep to April 1st and that is not strictly hardy nor very productive. The north needs now a variety of apple that has the flavor and keeping qualities of the Rhode Island Greening or Spitzenberg with the hardiness and productiveness of the Duchess, that will thrive on all kinds of soil as this variety has done from the Atlantic Ocean on the east to the Pacific Ocean of the west. The finding of such a variety would be worth thousands of dollars to northwestern Iowa.

THE OUTLOOK.

BY J. S. GRIFFIN, SAC CITY.

This subject is broad: So broad that it could be treated in many different ways, but we will endeavor to point out a few of the many discouragements of the past, and how they have been overcome by the efforts of zealous workers of the past and present; and the consequent results of such efforts upon the future.

Early in the settlement of this western region, some of our fathers began the propagation of fruit. Their early recollections carried them back to their boyhood days among the old orchard trees on the old farm in York state. They thought of those days as the brightest in their life and were anxious to surround their families with the Eden with which their lives had been blest, consequently they purchased some stock from the first agent who could tell a good story. They selected such trees and shrubs and plants as were the favorites in the old York state orchard, or garden, or if the agent seemed to be especially reliable, as so many were, they would use his advice in selecting some of the nobler sorts of fruit. At least a variety was selected and, generally, some of every thing; which at that time of early experimenting was undoubtedly a good feature, but although the selection was numerous and many of the varieties gilt-edged, their orchards or gardens seldom gratified the expectations of the planter.

It may have been, at the first, that the trees started nicely and his hopes were high as he saw the young trees; under his watchful care, spread out their branches to the warm sunshine; but as time advanced, his hopes diminished one by one as he saw his choicest varieties die first, then other

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varieties follow until there were only a few trees left standing alone and neglected. His hopes were blasted his Eden gone and woe to the tree agent who would so much as drive past the place.

Many failures were also due to location at that early time of planting, planters supposed the sunniest slope was best and that a north wind break was all that was needed. The results of these and many other discouragements tended to the belief that fruit growing in northern Iowa was a failure, and even to-day people will point to these discouragements of early days and shake their heads as though it was a question never to be considered.

But from all these discouragements came some sunbeams which to the more determined had an encouraging effect; although many of the varieties dwindled away and died one after another, still there was noticed a rough and rugged Duchess which stood in some remote corner of the orchard and which in the first luxuriant growth of the orchard had been set down as a scrub, had begun to show signs of not only living but of producing fruit, and farther up the row and occasional Wealthy or Ben Davis began to show their lasting qualities. This ray of sunshine has broadened until at the present it sheds its genial light over all the northwest and the people enjoy blessings untold.

At present we enjoy many advantages over our forefathers, although the path of the horticulturalist to-day is not always strewn with roses. We are in position, thanks to efforts of our fore-fathers, to make a judicious selection of varieties and to plant and care for them in a manner in which we may expect results which will reward us for our labor. As horticulture advances there seems to be new complications arise which cause renewed study and labor on the part of the successful horticulturist, fungus disease, innumerable insects and animal enemies and weather conditions are all to be studied and guarded against, but the successful horticulturist, unmindful of the discouragements, rises above them and is on the lookout for others.

No branch of industry is making more progress towards perfection than horticulture; we are coming nearer perfection in all kinds of hardy fruits; we are nearing perfection in our mode of caring for these fruits to obtain the best results. We study the habits of the fruits and can, by the knowledge obtained, increase our yield an hundred fold. We of the north have, and are, turning our disadvantages into advantages. Instead of giving away to our natural enemies we conquer them, and with a few of the persevering, march on to the head, there to reap a better reward than could we otherwise have done had the difficulties been less hard to conquer. Our disadvantages in the north make the work of horticulture a work for the energetic only; it is not a work that will prove successful without care; this does away with opposition from the class of people who would get something for nothing. On the other hand no work will give better returns than horticulture, where energy pushes it along. Not only does it give financial returns but of all occupations it is the best. Not only out of door labor but labor among plants which answers to every advantage given them. The outlook for the horticulturalist is bright; his sun is just touching the eastern horizon and is beginning to throw its bright rays across his path, and as time passes his sun shall rise higher and higher, varieties will improve to perfection for the north, we will understand how to protect our fruit and our growing population will form a home market never to be supplied with enough of the luscious fruits and all will be peace and plenty.

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PLUM CULTURE.

BY JOSEPH WOOD, WINDOM, MINN.

I grew many varieties and many of them I find worthless, some fair and some valuable. But I keep on adding to my collection every year for I think there are better plums coming than what we now have. But we can not look for any better kinds from our native grove for most of the groves are fenced to pasture and the trees are ruined by cattle. We have now a better opportunity to produce better kinds from seed of our choice plums by selecting the best specimens and also from hybridizing those we had by selecting from our native groves. I have found hybridizing a very difficult job, not many of them would take and I think it is on account of the winds we have, so I thought of another plan; let the bees do the work and I think they can do it better. Some years ago I grafted from five to six of our best kinds on one tree and now they are commencing to bear and I shall plant the seed grown in the trees. I am confident of good results from the work of the bees. We in Cottonwood county had a bountiful crop of plums, the best we had for a number of years and most of the varieties averaged good size, except the De Soto, which were no larger than the wild plum. Some claim the old trees of De Soto bear the largest fruit but I do not find it so, the largest plums were on the small trees. We sold sixty bushels this year besides what was eaten and given away. The prices received were $1.25 to $1.50 in Windom, and from the farmers from $1 to $1.25 and they pick the plums. The demand for onr native plums is growing every year on account of their size and quality. I was told by a lady she would sooner have our cultivated Minnesota plums than the picked before ripe California product. The plum season with us was this year from the 20th of July to September 25th, so we had ripe plums for two months, and I think it is a good thing to grow early, medium and late kinds, so they don't have to be put on the market at one time and glut the market and lower the price. And also some people are not ready to put them up at once, and some have not the money to buy till late, and so if one has the varieties he can fill all the orders. I sold all our plums to the consumer and I think this is the proper way. I will name some of my earliest and best sellers and the most productive, and also medium and late.

The following list did the best on my ground year after year and we have had no failures: For first, Early Minnesota; second, Iowa; third, Wood; medium, New Ulm, City, Rolingstone; late, Wyant, Wolf (freestone), Stoddard, Hawkeye. This list has taken the lead every year, and I think also with others that have them, but I don't mean to say they are the best every where and in all the states. I have many other sorts that are worthy of growing in a smaller way, like Cherry, Ocheeda, Macus, Neals, Peach and De Soto.

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QUESTION BOX.

SECRETARY: What is known of the Peerless?

P. F. KINNE: It proves to be a late fall apple and not large enough to have any special value.

SECRETARY: Is Gideon's Bert a winter apple? Its quality?

P. F. KINNE: Do not know Gideon's Bert, but the apple known as Gideon is about the same season as the Wealthy. A fine, large yellow apple with beautiful blush; of good quality.

SECRETARY: What would you plant in a town lot in apples, plums and cherries where a man can plant only a dozen apples and plums and one-half dozen cherries; also for a commercial orchard in this northern county, Palo Alto.

W. A. BURNAP: On town lot, apples—Two Tetofsky, 3 Duchess, 4 Wealthy, 3 Malinda; plums 2. Forest Garden, 4 DeSoto, 3 Stoddard, 3 Wyant. Cherries, none. Commercial orchard, one-half Wealthy, one-half Duchess.

QUESTION: What is the value of Carolina Poplar as a street and yard shade tree?

M. J. WRAGG: The Carolina Poplar in tree much resembles the Yellow Cottonwood, only it is free from cotton, which is one of the great objections to the Cottonwood. I am confident that it will prove a valuable street and lawn tree for planting in Iowa. Its tendency is upward and is greatly benefited by being top backed quite severely at planting. While at Indianapolis, Ind., last season my attention was called to the beautiful avenues planted with this variety of Poplar.

QUESTION: How are Cut Leaved Birch propogated?

M. J. WRAGG: In this country they are mostly grown by being budded on seedlings of the White Birch (*Betula alba*). A few years ago we grew quite a number of Birch and we had the best success with what is called spring budding, that is, we cut dormant buds during the month of March from the C. L. W. Birch and kept them in a cool ice-house until the middle of May, at which time we inserted the buds in the stocks of the White Birch, which were then about the size of a lead pencil. The

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results were very gratifying. It requires much skill and attention to grow them as they are quite rapid in growth and require staking and protection to keep the wind from breaking them down.

QUESTION: What size evergreens would you recommend when a man wants to set only a few for ornament, also when a wind-break is desired?

M. J. WRAGG: This question is often asked me and I have always said that for wind-break planting where the planter had free access of tillage by plow so that trees could be given as good cultivation as corn or potatoes that the best size was trees 15 to 18 inches or 18 to 24 inches, twice transplanted stock preferable; but in planting on the lawn we would recommend 2 to 3-feet evergreens, digging quite large holes, planting them at least 5 inches deeper than they stood in the nursery, firming the soil very hard about the roots, filling up the hole loosely on top and then mulch with manure or something which will retain moisture.

FRUIT LIST FOR 1901.

The following tabulated fruit list is made up from reports sent the Secretary by members of the society and others in the various counties within the northwest district, each one reporting such varieties as have proved adapted to his locality. It must be borne in mind that this list is made up of individual expressions for which the society disclaims all responsibility, but it is doubtless the best guide for the prospective planter that is possible to be obtained at present. In the markings the plan used by the northeastern society is here adopted: One (1) indicates the variety is perfect in hardiness and quality; two (2), of less degree, etc.; E. S. stands for early summer; S, summer; F, fall; E. W., early winter; W, winter; L, late; M, medium.

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FRUIT TABLE.

| COUNTY, NAME AND ADDRESS | APPLES. | | |

FRUIT TABLE—CONTINUED.

COUNTY, NAME AND ADDRESS.	APPLES.									CHERRIES.												
	Kaump.			Iowa Blush			Haas			Early Richmond.			Montmorency			Wragg.			English Morello.			Ostheim.	
	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.
Buena Vista county—L. A. Clemons, Storm Lake	..	....	..	..	....	..	..	....	..	2	E.	2	2	M.	1	2	L.	2	..	.....	..	..	....	..
Buena Vista county—Donald Hill, Storm Lake	..	....	..	..	....	..	..	....	..	2	E.	1	2	M.	1	2	L.	2	..	.....	..	..	....	..
Buena Vista county—A. S. Caulkins, Storm Lake	..	....	..	..	....	..	..	....	..	2	E.	2	3	L.	3	2	M.	2	..	.....	..	..	....	..
Buena Vista county—P. F. Kinne, Storm Lake	..	....	..	..	....	..	..	....	..	2	E.	2	2	M.	1	2	L.	2	..	.....	..	..	.....	..
Carroll county—W. F. Steigerwalt, Carroll	..	....	..	..	....	..	..	....	..	2	E.	2	..	.....	..	..	.....	..	2	L.	3	..	....	..
Cherokee county—H. L. Felter, Washta	..	....	..	3	EW	2	..	....	..	2	E.	3	..	.....	..	2	L.	4	..	.....	..	..	.....	..
Calhoun county—Geo. B. Starr, Manson	..	....	..	..	....	..	..	....	..	2	E.	1	2	M.	2	..	.....	..	2	M.	1	..	....	..
Dickinson county—H. N. Antisdel, Fostoria	2	F.	2	..	....	..	2	EW	3	..	....	..	..	.....	..	2	L.	1	2	ML	1	..	.....	..
Humboldt county—J. C. Bing, Ottosen	..	....	..	..	....	..	..	....	..	2	E.	2	..	.....	..	1	L.	2	..	.....	..	..	.....	..
Ida county—G. A. Miller, Holstein	..	....	..	..	....	..	..	....	..	1	E.	2	..	.....	..	..	.....	..	..	.....	..	1	L.	2
Kossuth county—J. E. Stacy & Son, Algona	..	....	..	..	....	..	..	....	..	1	E.	2	2	M.	1	1	L.	2	..	.....	..	..	....	..
Lyon county—E. Bradley, Rock Rapids	..	....	..	..	....	..	..	....	..	1	E.	2	1	M.	1	..	.....	..	..	.....	..	..	....	..
Monona county—C. Steinman, Mapelton	..	....	..	..	....	..	..	....	..	2	E.	2	3	M.	1	2	L.	2	..	.....	..	..	....	..
O'Brien county—Hector Cowan, Jr., Paullina	..	....	..	..	....	..	..	....	..	1	E.	1	..	.....	..	..	.....	..	..	.....	..	..	....	..
Osceola county—J. E. Townsend, Ashton	..	....	..	..	....	..	..	....	..	2	E.	2	..	.....	..	2	L.	1	1	L.	3	..	....	..
Plymouth county—F. P. Wernli, Le Mars	2	F.	2	..	....	..	2	W.	2	2	E.	2	..	.....	..	2	L.	2	..	.....	..	..	....	..
Plymouth county—Pierce Bechtle, Le Mars	1	EW	2	2	EW	2	..	....	..	2	E.	2	2	M.	1	2	L.	2	..	.....	..	..	....	..
Palo Alto county—C. D. Price, Ruthven	2	EW	3	..	....	..	..	....	..	2	E.	2	..	.....	..	1	L.	2	2	L.	2	..	....	..
Palo Alto county—D. C. Tipp, Osgood	2	....	..	..	....	..	2	F.	3	..	....	..	..	.....	..	..	.....	..	2	M.	1	..	....	..
Sioux county—J. C. Emery, Carnes	..	....	..	..	....	..	..	....	..	1	E.	1	..	.....	..	2	L.	1	..	.....	..	..	....	..
Sioux county—J. S. Haag, Hospers	..	EW	2	2	F.	2	..	....	..	2	E.	1	..	.....	..	1	M.	2	..	.....	..	..	....	..
Sac county—C. W. Conner Sac City	..	....	..	..	....	..	..	....	..	2	E.	2	..	.....	..	1	L.	1	..	.....	..	..	....	..
Sac county—C. E. Griffin, Sac City	1	LF	4	..	....	..	1	LF	4	2	E.	1	..	.....	..	1	L.	1	..	.....	..	..	....	..
Webster county—W. C. Haviland, Ft. Dodge	..	....	..	..	....	..	2	LF	3	2	E.	1	1	M.	1	..	.....	..	2	L.	2	..	....	..
Woodbury county—B. Shontz, Correctionville	1	F.	1	..	....	..	..	....	..	1	E.	1	..	.....	..	..	.....	..	..	.....	..	1	M.	1
Woodbury county—A. W. Hatfield, Correctionville	..	....	..	..	....	..	..	....	..	1	E.	1	..	.....	..	..	.....	..	2	L.	1	..	....	..
Woodbury county—I. N. Stone, Sioux City	..	....	..	2	EW	3	..	....	..	1	E.	1	1	M.	1	1	L.	1	..	.....	..	..	....	..
Number reporting	7	....	..	4	....	..	5	....	..	25	....	..	11	.....	..	17	..	..	8	.....	..	2	.....	..

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FRUIT TABLE—CONTINUED.

COUNTY, NAME AND ADDRESS.	PLUMS.																																			
	Wyant.			De Soto.			Miner.			Ocheeda			Wolf.			Hawkeye.			Stoddard.			Forest Garden.			Wild Goose.											
	Hardiness	Season.	Quality	Hardiness.	Season.	Quality	Hardiness.	Season.	Quality.	Hardiness	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness.	Season.	Quality.	Hardiness	Season.	Quality.	Hardiness.	Season.	Quality.										
Buena Vista county—L. A. Clemons, Storm Lake	1	M.	2	1	M.	1	2	L.	1	1	M.	1																								
Buena Vista county—Donald Hill, Storm Lake	1	M.	1	1	M	1							1	L.	2																					
Buena Vista county—A. S. Caulkins, Storm Lake				1	M	1	1	L.	3				1	L.	1	1	L.	2																		
Buena Vista county—P. F. Kinne, Storm Lake	1	M	2	1	M	1	2	L.	1	1	M.	1																								
Carroll county—W. F. Steigerwalt							1	L.	1										1	M.	1	1	E.	2												
Cherokee county—H. L. Felter, Washta	1	M	2	1	M.	2							1	L.	2																					
Calhoun county—G. B. Starr, Manson	1	M	1	1	M.	1										1	M.	2	1	L.	2															
Dickinson county—H. N. Antisdel, Fostor	1	M.	1	1	M.	1	3	L.	1							1	M.	2																		
Humboldt county—J. C. Bing, Ottosen	1	M.	1										1	M.	2	1	M E.	2	1	M.	2															
Ida county—G. A. Miller, Holstein				1	E.	1	1	L.	1				1		2							1	M.	1												
Kossuth county—J. E. Stacy & Son, Algona				1	M.	1							2	L.	1																					
Lyon county—E. Brailey, Rock Rapids	1	M.	1	1	M	1	2	L	1				1	L.	1																					
Monona county—C. Steinman, Mapleton														M.	2							1	E.	1	3	E. S.	2									
O'Brien county—Hector Cowan, Jr., Paullina	1	M	1	1	E.	1				1	M.	1				1	M.	1																		
Osceola county—J. E. Townsend, Ashton	1	M.	1	1	E.	1							1	M.	1	1	M.	1	1	M.	1															
Plymouth county—F. P. Wernli, LeMars	1	M.	2	1	M.	1	2	L.	1				1	L.	2																					
Plymouth county—Pierce Bechtle, LeMars	1	L.	1													1	M.	1	1	L.	1	1	E.	2												
Palo Alto county—C. D. Price, Ruthven	1	M.		1	M	2										1	M.	2																		
Palo Alto county—D. C. Tipp, Osgood				1	E.	1	1	L E	2																											
Sioux county—J. C. Emery, Carnes				1	M.	2										1	M.	2				1	M.	1	1	L.	1									
Sioux county—J. S. Haag, Hospers				1	L.	1							1	L.	?							1	E.	1												
Sac county—C. W. Conner, Sac City	1	M.	2										1	M.	2				2	M.	2															
Sac county—C. E. Griffin, Sac City	1	M	1	1	L.	1													1	L.	1				1	M.	1									
Webster county—W. C. Haviland, Fort Dodge	1	E F	1	1	E F	1	1	L.	1				1	E F	1																					
Woodbury county—B. Shantz, Correctionville	1	E.	1	1	E.	1							1	E.	1																					
Woodbury county—A. W. Hatfield, Correctionville				2	E.	1	1	L.	1																1	M.	1									
Woodbury county—I. N. Stone, Sioux City				1	E	1	1	L	2							1	M.	1				1	E.	1												
Number reporting	17			23			12			3			14			10			7			7			4											

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Grapes.—Moore's Early, Concord and Worden are recommended by practically every correspondent. A few have in addition recommended the following: Jamesville, Early Ohio, Brighton, Agawam, Pocklington, Hartford, Clinton, Cottage, Green Mountain, Niagara.

Strawberries.—The following varieties received the highest number of recommendations in the order named:

Bederwood (25), Warfield (20), Crescent (19), Lovett (9), Clyde (7) Parker Earl (7).

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Twenty-sixth Annual Meeting

OF THE

Southwestern Iowa Horticultural Society,

HELD AT

Shenandoah, Iowa,

DECEMBER 18, 19, AND 20, 1900.

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LIST OF OFFICERS.

PRESIDENT.

J. P. JACKSON ..... Glenwood

VICE-PRESIDENT.

J. H. M. EDWARDS ..... Logan

SECRETARY.

W. M. BOMBERGER ..... Harlan

TREASURER.

O. H. BARNHILL ..... Shenandoah

DIRECTORS.

Subdistrict No. 1.—Mills, Montgomery, Fremont and Page counties.

Henry Field ..... Shenandoah

Subdistrict No. 2.—Adams, Taylor, Union and Ringgold counties.

Geo. H. Van Houton ..... Lenox

Subdistrict No. 3.—Clark, Lucas, Decatur and Wayne counties.

A. F. Coleman ..... Corning

Subdistrict No. 4.—Pottawattamie, Harrison and Shelby counties.

C. H. Deuer ..... Missouri Valley

Subdistrict No. 5.—Cass, Adair, Audubon and Guthrie counties.

James McGinnis ..... Griswold

Subdistrict No. 6.—Madison, Warren, Dallas and Polk counties.

B. Stuart ..... Rural route No. 1, Altoona

Committee to widen the usefulness of the society—Geo. H. Van Houten, O. H. Barnhill, D. B. McCalla, F. P. Spencer with the executive committee of the society.

Local Committee—B. B. Clark, O. J. Gibson, E. Kretchmer, Issac Sanborn, Jr., all of Red Oak, Iowa.

Annual membership fee, $1; life membership fee, $5, which entitles the member to a post-paid copy of horticultural report, containing the reports of the state and auxilliary societies.

LIFE MEMBERS.

Alger, W. S. ..... Villisca
Bomberger, W. M. ..... Harlan
Coleman, J. E. ..... Farragut
Coppock, John A. ..... Griswold
Davis, Thomas A. ..... Council Bluffs
Deuer, C. H. ..... Missouri Valley
Everett, Leonard ..... Council Bluffs
Giddings, E. T. ..... Missouri Valley
Van Houten, George H. ..... Lenox
Waterman, F. G. ..... Fresno, Cal.

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Williams, L. A.....Glenwood
Wood, Alexander.....Council Bluffs

HONORARY LIFE MEMBERS.

Bonham, A. S.....Council Bluffs
McGeehon, R. D.....Atlantic
Redmond, S. H.....Villisca
Sterns, Mrs. M. R.....Logan
Taylor, F. W.....Lincoln, Neb.
Terry, H. A.....Crescent
Williams, L. O.....Kearney, Neb.

HONORARY MEMBERS.

Brown, A. J.....Geneva, Neb.
Marshall, A. B.....Arlington, Neb.
Marshall, A. W.....Arlington, Neb.

ANNUAL MEMBERS.

Barnhill, O. H.....Shenandoah
Black, J. R.....Griswold
Bordman, A. E.....Coin
Castile, George H.....Shenandoah
Colby, J. N.....Tabor
Collman, A. F.....Corning
Dodge, N. P.....Council Bluffs
Doyle, Michael.....Logan
Edwards, J. H. M.....Logan
Elliott, A. P.....Red Oak
Fancolly, L.....Atlantic
Field, Henry.....Shenandoah
Fletcher, J. A.....Rural route No. 1, Farragut
Fritch, G. F.....Emerson
Gay, E. R.....Griswold
Greene, Wesley.....Davenport
Hartman, A.....Clinton
Hess, J. P.....Council Bluffs
Jackson, J. P.....Glenwood
Lake, D. S.....Shenandoah
Laughlin, J. B.....College Springs
Latimer, J. A.....Shenandoah
Lotspeich, D. W.....Woodbine
McCalla, D. B.....Clarinda
McGinnis, James.....Griswold
Miller, G.....Anita
Morrison, W. P.....College Springs
Needles, I. M.....Atlantic
Philo, F. S.....Rural route No. 1, Imogene
Powell, Dr. F. M.....Glenwood
Spencer, F. P.....Randolph
Stuart, B.....Rural route No. 1, Altoona
Welch, E. S.....Shenandoah

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Wilfrey, H.....Clarinda
Williams, M. J.....Glenwood
Wilson, Silas.....Atlantic

SUGGESTION TO MEMBERS.

Assignment of subjects to report on at Red Oak meeting December 17, 18, 19, 1901, will be made during the summer and fall. It will be the endeavor of the officers to arrange such program as will best benefit the whole society. Suggestions are requested from any and all members for aid in making up the program. We would like to have it reflect the work of the season, but prefer to have enough informality in it to make it personally interesting to all.

Keep in mind as you work in the orchard, vineyard, fruit and vegetable garden, as you prune, cultivate, glean, and take pleasure trips along orchard rows, if you find a new truth, new fact, or even an old fact of wider than local application that your society friends would like to hear from you. It is a good thing to carry a note book and often jot down thoughts by the way and toward the close of the season collate facts and bring the garnered wheat to our meetings. But write any time to any officer of the society.

W. M. BOMBERGER,
Secretary.

LIST OF PREMIUMS.

TO BE AWARDED AT RED OAK, IOWA, AT THE ANNUAL MEETING, 1901.

	First.	*Second.*	*Third.*
County display of fruit	$10.00	$7.00	$4.00
Individual display of fruit	8.00	5.00	....
Plate of five seedlings	3.00	2.00	....
Collection of vegetables	3.00	2.00	....
Display of canned fruits	5.00	3.00	....
Best plate of five each of the following	.30	.20	.10

Ben Davis, Benoni, Fameuse, Fall Winesap, Grimes, Genet, Jonathan, Lowell, Oldenburg, Red June, Romanstem, Winesap, Maiden Blush, Wealthy, York Imperial, M. B. Twig, Mo. Pippin, Utter, Sheriff, Minkler.

In county collections fruit must be grown in county, and there must be not less than twenty-five varieties, in a good state of preservation, correctly named.

In individual collections there must be at least fifteen varieties in a good state of preservation, correctly named; the fruis must be grown by exhibitor, and on demand he may be required to make oath to that fact.

Canned goods must be put up in glass, and not less than pints.

Jams and jellies must be put up in not less than half-pints.

Parties desiring to enter same variety in differedt ciasses, must have duplicate entries, as the same fruit will not be awarded two premiums.

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Exhibitors must properly label varieties, and file with the secretary a full list of varieties in each exhibit. In plate premiums exhibitors shall enter all names in one list.

If exhibits are small and unworthy of premiums offered, the society or committee may award a smaller amount of money, or refuse to award premiums on unworthy exhibits.

See volume 31, pages 455 and 466 of report, for rules governing awards by committees.

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PROCEEDINGS

OF THE

TWENTY-SIXTH ANNUAL SESSION

OF THE

Southwestern Iowa Horticultural Society,

HELD AT SHENANDOAH, IOWA, DECEMBER 18, 19 AND 20, 1900.

The twenty-sixth annual session opened at 9 A. M. in the Christian Church, Shenandoah, Iowa, with President J. P. Jackson in the chair and all the officers present. The invocation was offered by Hon. Geo. H. Van Houten.

COLORED AND VARIEGATED TREES AND SHRUBS FOR ORNAMENTAL PLANTING.

BY J. L. BUDD, AMES.

The topic assigned me may properly include some of the colored barked trees and shrubs for winter effect, and even some that display bright colored berries in late fall and winter.

TREES AND SHRUBS FOR SUMMER AND WINTER EFFECT.

Cut Leaved Birch.—The few who have fine specimens of this noble tree need not be told that it is hamdsome in its summer garb, and its silvery white bark gives it an interest in winter.

Salix Aurea.—In summer the shinning leaves form a fine contrast with the golden yellow bark of stem, limb and twig, and in winter its golden yellow expression is admired from afar.

Silver Spruce.—While many evergreens are handsome in summer and winter the Colorado Silver Spruce *(Picea Pungens)* stands at the head. Its winter expression is attractive even in a blizzard or on a frosty morning.

Buffalo Berry.—This hardy native of the far northwest exhibits its silvery leaves and twigs in summer, its load of bright red berries in autumn, and in winter its silvery white bark and twigs on which the silvery bark seems ready to open in midwinter have special interest.

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Red Twigged Dogwood.—The *Cornus Sanguinea* of the catalogues has merit as a summer shrub and in winter it has special interest as it lifts its bright red branches above the snow.

Burning Bush.—Our native Waahoo or Burning Blush makes a neat thrifty, handsome leaved blush in summer if some attention is given to shaping and pruning, and in late autumn and early winter it is loaded with scarlet seed pods from which the rich colored berries hang on slender threads.

Berberis Thunbergia.—This oriental shrub naturally forms a rounded head with handsome small leaves and flower buds that explode when touched to scatter the pollen. In autumn the leaves take on beautiful colors and in winter its crop of bright red berries are attractive.

Hippophea Sibirica.—This siberian shrub is closely related to our Buffalo Berry. A small group on the lawn, with one staminate plant, gives a striking expression on account of its silvery expression, and in early winter its bright colored berries form a fine contrast with the silvery bark.

Lonicera Media: This very hardy climbing honeysuckle has fine glaucous leaves and fine flowers in the season of growth, and its crop of scarlet berries hang on nearly all winter. For some reason the birds do not disturb them as they do all other honeysuckle berries.

SOME TREES AND SHRUBS WITH COLORED OR VARIGATED LEAVES.

Acer Ginnala: A very hardy dwarf hard maple with handsome lobed leaves that take on in autumn gorgeous colors often prior to the first frosts.

Acer Schwerdleri: A variation of the Norway maple with bright purplish or crimson leaves. As the season advance the older leaves, or the base of the shoots, change to purplish green in color forming a pleasing contrast. A very hardy and beautiful shade tree for the back lawn.

Wild Olive: This very hardy small tree is now so widely known that I will only say that its silvery leaves and twigs are not its only charm. When in bloom it is the most fragrant tree of the temperate zones.

Prunus Padus Aucubifolia: This is a spotted leaved variety of the European bird cherry. It is highly prized over a large part of Europe, and where known in this country. It is with us. hardier and handsomer when top-worked on our wild black cherry.

Pyrus Aria Nivea: This is a variegated and silvered leaved variety of the white beam tree of Europe. It forms a neat small tree for the lawn. It can be propagated on apple or pear roots.

Liburnum Lantana; This is the European type of the Hobble bush of the eastern states. Its soft plicated and variegated leaves are handsome at all times and its cymes of white flowers are followed by fruit that hangs on well into winter.

The extent of this brief paper is not to make a full list but to give attention to a few of the best things for home planting.

W. GREENE: The Golden Spirea, or Nine-bark, is one of the best shrubs with yellow foliage for general planting. The Golden Elder is also desirable, and perfectly hardy any place in this district, but burns badly in dry soil. The variegated Weigela is a handsome plant but not very robust and only succeeds in a good location. The Purple Berberry is the best shrub in that color.

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Leaves of the *Prunus Pissardi* lose the purple color through the heat of summer. *Cornus sanguinea* is desirable on account of the bright red bark in the winter.

W. M. BOMBERGER: The grouping of Golden Elder and Purple Berberry produced the best effect we saw in the Chicago parks.

J. P. JACKSON: I would like to know if the Russian olive is a tree or shrub?

W. GREENE: It is usually considered a tree. The distinction between a dwarf tree and a tall shrub is not very definate. The Abele tree of northern Europe is very effective when the leaves are moved by a light breeze, bark green above and silvery beneath; the objection to it is that it sprouts from the roots.

SILAS WILSON: That is the objection to the Abele, the public seriously object to the sprouts.

W. GREENE: The Carolina popular which the secretary mentioned is only a cultivated form of the common cottonwood and is open to all the objections urged against that native tree.

BIRDS AND THEIR RELATION TO HORTICULTURE.

BY FRANK C. PELLETT, ATLANTIC.

It may be well to devote the short time at our disposal to the consideration of some of our most common birds, more particularly those about which there is some doubt in the minds of many as to their value. In beginning with the much censured blue-jay, let me say that in an investigation of the food habits of this bird by the biological survey, nearly three hundred stomachs were examined, and it is upon the result of this examination that my conclusions are based. The fruits eaten include apple, strawberries, currants, blackberries, mulberries, blueberries, wild cherries, huckleberries, choke cherries, wild grapes, serviceberries and elderberries.

Of course the birds were taken over a large scope of country and under various conditions, and much of the fruit named is of no value. For our present consideration we need mention only four, apples, currants, blackberries and strawberries. We should also bear in mind that most of the apples were taken in winter, so of course was discarded fruit left on the trees, also many of the berries, especially blackberries, were wild. To offset this over sixty-six per cent of the entire food for the month of August consisted of insects largely harmful, this large percentage holding good well through the fruit season, at which time insects are plentiful.

Many such beetles as the goldsmith beetle, spotted grapevine beetle, brilliant tumblebug, and May bug were found, as well as a large number of fruit eating beetles such as Euphoria india, some leaf eating beetles, click beetles, a number of curculios, grasshoppers, crickets, locusts, etc. Cater-

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pillars form an important element in the birds' food, it being well known that the jay is an important factor in the destruction of tent caterpillars and gypsy moths.

The king bird or bee martin is another whose motives are questioned. About ninety per cent of the king bird's food is composed of insects mostly injurious. The much repeated statement that he is an enemy to the apiarist is a very mistaken notion, as it has been conclusively proven that the bird feeds very little upon bees and usually none are taken except drones.

Apiarists seeing the bird at work near their hives have shot a number of them and had the stomachs examined by an expert entomologist who was unable to find a trace of a bee.

The bird does feed on robber flies to some extent. This insect prays upon the honey bee and is a far greater detriment to the hive interests than the king bird. Some orchardists have a grudge agaist the woodpeckers also. There are several species in this locality all of which are unquestionably beneficial, as they feed principally upon insects not accessible to other birds. With beak and tongue especially fitted for such work, they dig out and devour many noxious insects, that but for them would continue their work of destruction unmolested until the trees of not only our orchards, but also our forests would be honey combed by borers, ants, etc.

From one-half to two-thirds of the food of wood-peckers consists of insects mostly noxious. The vegetable food varies considerably, the fruit of the dog-wood, Virginia creeper and seeds of such shrubs as sumach, poison ivy, etc., constituting a large part of diet. But little cultivated fruit is taken, although the red head in the cherry tree is a familiar sight.

We come now to a class of birds to which no exception can be taken. First we will mention the orioles, which feed very largely upon caterpillars, click-beetles, bark lice, spiders, etc. Then there are the cuckoos, which are among the most beneficial of our birds. To give an idea ot the food habits of these birds, let me say that the examination of one stomach of a black-billed cuckoo disclosed twelve American tent caterpillars; another 217 fall web-worms.

The rose breasted grosbeak or pea-bird as he is commonly called, that fellow who at a single meal will devour enough potato bugs to pay for all the peas he will eat in a whole season. In gardens quite often the grosbeaks will entirely rid the potatoes of the beetles. In larger field of course this is impossible on account of the great number of insects. This is about the only bird that will eat a Colorado beetle.

Then there are the swallows, and the wrens, and phoebes, and a dozen more that we cannot presume to take time here to consider although they are equally worthy with those already spoken of; but no orchardist should be found guilty of killing any bird except the English sparrow. Not an insect pest with which we have to deal but has a natural enemy in some of our birds. The bark-lice in the orioles, the borers in the wood-peckers, and that very large family of insects, the aphides, are kept in check by the martins, and thus we might go on and enumerate until we are tired, and not be half through either. But we must take better care of these friends if we wish to preserve them, as they are decreasing very rapidly from several causes, mainly from indiscriminate collection of eggs by school children, from the

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millinery trade, and last, but by no means least, the warfare of the English sparrow.

Birds are indispensable to the best interests of our orchards, vineyards and berry patches, and should be taken into consideration by all who are any way dependent upon the fruit industry. If every farm had its five or ten acres of native trees, there would be more birds and more and better fruit. Many of our birds will not nest in a few maple trees that constitute the grove around most farm homes, because, it does not afford a natural forest condition. No country home is complete without a few acres of trees growing as nearly as possible in harmony with the natural conditions, and we feel safe in saying that any farm of eighty acres which has five acres in timber gets better return for the investment and labor expended from the five acres than from any like acreage on the farm.

W. GREENE: I notice that the English sparrows about the capitol last summer ate a great many grasshoppers and other insects. I am a great friend of the birds, but have no special admiration for the English sparrows.

HENRY FIELD: Robins, cat birds and blackbirds are very troublesome in berry patches and I would like to know how to manage them?

D. B. MCCALLA: I tried to poison the sparrows by placing some in bread, but they ate the bread and poison without any apparent harm to them:

W. GREENE: I think that netting placed over trees is the best method of saving cherries and other fruit from the birds that has been recommended.

JAMES FIELD: I tried Russian mulberries, but the birds ate the berries and the cherries too; it did not save them.

J. P. JACKSON: Robins do a great deal of good and some harm. I am inclined to advise dividing the fruit with them. I have noticed what Mr. Greene says he saw—English sparrows taking insects and eating grasshoppers.

JAMES MCGINNIS: The wren is the best friend we have; it and the oriole are the best I have for cleaning out insects that infest the garden. We give them nesting places and encourage them to stay with us.

HENRY FIELD: The butcherbird, though it has an unpleasant name, I regard as of great value; it kills vermin and prey enough for itself and hangs up plenty for a rainy day. I believe they are as valuable as cats.

W. M. BOMBERGER: Reptiles, snakes of most every description rid premises of vermin. We should give no place to rattlesnakes, blue racers, or copperheads, but garters, bullsnakes and

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most of the common sorts are perfectly harmless and do much good.

J. H. M. EDWARDS: Many of us, who wear the button, did not in 1861 to 1865 give much place to copperheads.

HENRY FIELD: We never kill snakes on our premises.

ORCHARD MANAGEMENT.

D. B. MCCALLA: I was asked to write a paper on another subject but had an option on this one and as it is along the line of my experience so can give it in a few words. I became a member of this society in 1893, and soon afterward planted 1,200 apple trees. I got the back numbers of the reports and studied them, and secured all the available information I could to guide me in the selection of varieties, planting and management of the orchard.

Your former secretary, Mr. Geo. H. Van Houten, had obtained a vote of the society on varieties, and I made a selection from that list. I feel well satisfied with the intelligent directions given by you gentlemen. I have made mistakes, but have, in a measure, been successful in this venture. The mistakes have been charged up against myself because of inexperience, but I wish to thank this society for the kindness it has shown and the valuable information it has given in these reports. A dollar a year does not measure the value they have been to me.

I have planted largely of the Ben Davis, Winesap and Janet; prepared the ground as for corn and had intended to plant twenty feet apart in the rows north and south, but just when ready to plant changed my mind on the advice of a local nurseryman and set the trees thirty feet apart each way. The following winter was a bad one and I lost a great many trees; but replanted the next spring and gave the orchard good cultivation for six years then sowed it to clover. Have had some fruit, but since the trees have reached the bearing age we have had unfavorable seasons for fruit. Only a few bushels last year and this season there were more, but the storms blew off a great many. I wish to repeat that I feel much indebted to the society and take pleasure in stating that my success has been largely due to your efforts. My orchard came through the last test winter with the loss of only twenty trees out of the 1,200 that are in bearing. I was just getting the orchard seeded down to clover that season, and there were some weeds in the tree rows that winter.

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W. GREENE. In planting an orchard, I would advise planting close in rows north and south and fully thirty feet or more for apple trees between the rows. Trees close to each other give mutual protection, but they must have sun-light, and this is best secured by having the rows far enough apart. Our first orchard was planted in 1856, 20x20 feet, and when the trees were twenty years old the branches interlocked; made a dense shade beneath. The fruit was at the top of the trees where it was more difficult to pick it than when more evenly distributed over the tree. It is also more difficult to spray an orchard where the branches interlock or touch each other by having the rows close together. We prefer the hedge-row system of planting to the thicket that close check planting gives. Would plant a short-lived tree alternately in the row with those that are longer in coming into bearing and that usually live longer.

JAMES MCGINNIS: I would suggest the planting of peach trees for short lived trees, and also pear trees. This has been demonstrated to pay on the farm of Mr. Graham, who lives near me at Griswold. I have 400 peach trees that came through the hard winter. Seedling peaches are hardier than the grafted sorts. I have noticed that peach trees standing alone in exposed places are not as hardy as those planted among other trees. They do best when planted close together. My apples have not been injured by the presence of the peach trees. We have no use for the poor apples and peaches that are shipped in, for any one, if he will, can raise better fruit on his own premises.

J. P. JACKSON: Judge Wellhouse, the apple king of Kansas, says, "That such a combination is good for the peach but not for the apple."

GEO. H. VAN HOUTEN: Do not think it is advisable to mix varieties of fruit when planting. Would plant some early bearing, short-lived apple in preference; have succeeded with the Wagener apple in Taylor county planted in that way. I think the suggestion to have the rows wide apart and the trees close in the row an excellent one. But of all things do not plant indiscriminately of seedling peaches; have found it to be a mistake in my experience.

HENRY FIELD: I would take exceptions to that statement. I succeed nicely with seedlings, and with the peach much of the success now of large growers in Fremont and Page counties has been in growing seedling fruit. These are not only grown in family orchards, but in commercial orchards also. One such orchard of thirty acres is represented at this meeting and many

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of the trees in it are seedlings. I bought of a nurseryman some budded varieties of peaches. They turned out to be seedlings, with the exceptions of a few, and the grafted trees went out, but the seedlings remain and are doing well.

JAMES MCGINNIS: Many succeed with seedlings up at Griswold. They are sure bearers and give quick results.

GEO. H. VAN HOUTEN: In '56 we planted seedling peaches in Taylor county and so did my neighbors. I set out 900 trees grown from selected fruit and the result was variable, most of the fruit was without value. It was claimed that the Bailey was a good seedling, but it is not larger than a hulled walnut in many plantations and has caused much disappointment. I do not doubt that the Bailey, where not pollenized by other varieties, is good, but the indiscriminate planting from mixed stock has discouraged many people from trying it. I want to advise against cumbering your premises with worthless seedling fruits. This advice is given for the fruit grower and not the specialist who is doing experimental work with seedlings for pleasure and study.

HENRY FIELD: I think it is better to grow seedling peaches that are little and poor in quality than to try to grow budded stock and have none at all. All of my budded trees went out, but the seedlings remain.

SILAS WILSON: I think we ought to sound a note of warning about the indiscriminate planting of seedling peaches. The Ellison peach that originated in Ohio, very clearly reproduces itself from seed. It is a Free-stone, and that rarely occurs as seedlings are mostly clings. As to the Bailey, I have expended a great deal of money on it, expecting wonders from that variety, and find it to be no good at all—the most worthless of all varieties on my soil. Have tried fruiting trees from seeds and got bad results.

JAMES MCGINNIS: I went to Missouri for fruit to bring north to sell on the market and we found many large plantations of seedling peaches, and the fruit averaged well, in many cases nearly as large as budded varieties, and sold readily at one dollar a bushel, and brought money to the growers.

J. P. JACKSON: I think Mr. Van Houten's advice good; it is not to stop planting seedlings, but not to overdo it by planting indiscriminately.

HENRY FIELD: I would like to know who saved budded varieties through the hard winter?

J. P. JACKSON: I saved Elberta, Champion, Early Crawford, Mountain Rose, Wonderful, Hill's Chili and Crosby.

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D. B. McCALLA: All my peaches of the grafted sorts went through the winter all right.

W. M. BOMBERGER: All my nine year-old trees went out, but a younger plantation partly went out, but a part of it was saved. I am eighty miles north of here, but with all of my experience with peaches, think that inherent hardiness of variety is not of as much value as location that is favorable; a warm, sheltered hillside is the best place for peaches in our locality. There may be three to five degrees, possibly six to eight, in ability of trees to stand cold. Conditions of fall growth and ripening of wood are items to be considered, a rain, or a few rains, at a critical period, when we generally have dry falls, is a large factor in determining wintering and hardiness. Extreme hardiness is represented in Alexander, Early Rivers, Triumph, Champion, Crosby and Bokhara types. The first two varieties have, so far, given us the most fruit; spring wagon loads have sold at $2 to $2.50 a bushel. Elberta is not hardy with me.

REV. WM. STEVENS: I am glad to meet with you. I had an appointment with you early this morning, but I was on a train that was side-tracked, a thing that occurs at times in our lives. I note here that others than those who are theologians differ. Am glad to hear this talk on peaches. I cannot, even as a layman, enter into your discussions, but we have, with all the rest of the world outside of your work, an interest in the result. We all depend on each other, and never act independently. I rejoice to meet all of you in such an able calling and pursuit.

VEGETABLES, BEST VARIETIES.

HENRY FIELD: This is a common subject, but the vegetable garden is not so prominent a thing as it should be; much depends on it. The burden of my suggestions would be, do not burden yourself by planting too many varieties and sorts. Don't scatter the list. The tendency every year is to widen the list; this leads to confusion. It is hard then to know what to plant; as an example it is easy to pick up a catalogue and find as many as thirty varieties of tomatoes listed. Only a few varieties of each are needed. We recommend the following:

Tomatoes—Dwarf Champion, Stone, Golden Queen.

Watermelons—Cole's Early, Sweet Heart, Ice Cream, Ivory.

Muskmelons—(Yellow flesh) Emerald Gem, Perfection; (green flesh) Netted Gem, Hackensack.

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Potatoes—(For early) Early Ohio, Early Michigan; (late) Livingston, Carmen No. 3.

Sweet Corn—1st, Cory; 2nd, Early Champion; 3rd, Stowell's Evergreen; 4th, Country Gentleman, or Shoepeg.

Peas—Extra early, Philadelphia; medium, Premium Gem; late, Everbearing.

Beans—Wardwell's Kidney Wax.

Onions—Red Weatherfield, Prizetaker. Transpanting onions does not pay; we have tried it and find that thinning out seedlings in the rows is better. We raise on an average 200 to 300 bushels an acre, but have raised as high as 700 bushels.

Lettuce—We think most of Simpson.

Squash—Hubbard, or the warty form of Hubbard, is best; Fordhook is good for fall and winter use.

Asparagus—Conover's Colossal is best, or the white form of it called Columbian Mammoth.

Cabbage—Jersey Wakefield, and late Drumhead, or some form of it.

I. M. NEEDLES: I do not think you have the regular Country Gentleman sweet corn. The grains are very deep and the ears two-thirds as large as Stowell's Evergreen. It is now considered the finest in quality for canning of all sorts, also for table use. The early corn does not get wormy because the moths do not hatch out until late, so they get on the late corn.

W. M. BOMBERGER: Shoepeg sweet corn, or country Gentlemen as it is sometimes called, is the highest in quality of all sweet corn. We grow it in successional planting, and this year used the last on October 2nd.

(Director's report of the sixth district was read.)

SUMMARY OF DIRECTOR'S REPORTS.

The apple crop was not large, less than 50 per cent, in southwestern Iowa in 1900. In the sixth district a fair crop of summer and fall apples were reported, but the crop of winter apples small and much of the fruit imperfect. Winter apples sold at 75 cents to $1.00 a bushel at picking time.

Plums were reported at 25 per cent to 50 per cent of a crop. The fruit was much damaged by rot and sold on the market at $1.00 per bushel.

Cherries were generally reported as a good crop and brought from $1.50 to $2.00 a bushel.

Wherever peach trees survived the winter they were reported as having good crops, and the fruit sold at a good price.

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Grapes, raspberries and blackberries were a light crop on account of the scarcity of plants. Wherever bearing wood remained it produced a fair crop of fruit.

Strawberries, a light crop. Gooseberries and currants produced an average crop.

An increasing interest in pear growing was reported from the sixth district.

GEO H. VAN HOUTEN: I wish to take exceptions to and challenge the statements made in the last paper—the public can grow pears as well as apples. I thought so once, and went to the expense to plant a number of pear trees but did not succeed with them.

JAMES MCGINNIS: I wish to say that I have pear trees and do succeed with them; trees of Keiffer bore a nice crop of fruit. They are on timber soil, east slope. Others succeed with them on bottom land.

HENRY FIELD: Have Keiffers that are nine years old that bore some fruit; no full crop.

RELATION OF HORTICULTURE TO AGRICULTURE.

BY G. H. VAN HOUTEN, LENOX.

Agriculture includes horticulture, and it is expected, of course, that their relations and interdependence on each other shall be discussed.

Agriculture embraces all animal and plant growth for domestic use, and horticulture, in its broadest meaning, includes that part of agriculture embraced in plant growth; but, by common concent a more restricted meaning is applied to the word horticulture, especially when considered in the manner here proposed. It is often difficult to tell where the line of division may be, but that there may be some demarkation lines, let us consider that agriculture embraces grains, grasses and pastures, as used in the ordinary farm way. It is realized that this is not a clear division, for onions or other vegetables such as potatoes, beets, beans and, in fact almost all vegetable crops, may be grown in the garden, when, if so grown, they would be classed as horticultural products, while, if grown on a large scale they might, under the faulty division proposed, be denominated agricultural products; yet, it is believed that no confusion will result, even if a faulty division is the best that can be offered. With this thought in mind the subject will be discussed and the classes so arranged as to call all fruits, the garden, the lawn, the orchard, the vineyard, the berry plantations and even ornamental and shade trees as horticultural products. And, when so considered, will try to speak of their relation and dependence.

Horticulture was the first occupation of man, and yet in modern times we find that agriculture preceeds what we call horticulture. But it must be remembered that the first orchard came direct from the hand of God. There

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was not the necessity for man to inform himself as to varieties, climatic conditions or adaptation of varieties or soils or environments; these were all made ready by the Great All Father and man only had to dress and keep which he failed to do, so there have been brambles and thistles and weeds and blights and mildews ever since, and probably will be to the end of time. But it was not the purpose to discuss these things, but merely to speak of the relations existing between the two branches of agriculture. No difference what may have been the conditions at first, they are quite different now. When men began to roam over the earth, existence was the first law or necessity. It is probable that nature provided the living, such as it was, even after our first parents were driven out of paradise, but with the natural increase of population, natural resources were exhausted and it became necessary to add to nature's supplies by other means. It is probable that the first efforts were directed in keeping over beyond their natural season, things that were desired or were necessary to support life, and, by slow but gradual means agriculture developed. From being hunters our ancestors became flock masters and later farmers and horticulturists or gardeners. It is probable that the first was merely of those things that were necessary to sustain life, while, later, as taste and conditions improved, there was an effort to produce and save those things that were luxuries.

If this was not the rule in ancient times it is the rule in modern times, for the wild tribes and the semi-civilized of earth do that way now. Even the pioneers of our own state, and within the range of our own recollections and experience, directed their energies to the growing of things that were really necessary and then the list was short indeed, as compared with the present time. Then it was common in agriculture to secure a large supply or at least a large proportion of the supply of meat from wild animals and fish from the streams. Even wild fruits were depended on, in fact, were all the kind that we had in early days and many a boy and girl arrived at the age of youth or nearly maturity without ever having seen an orchard or even cultivated fruits. Very few, born and reared in civilized countries, experienced, in modern times, the entire lack of what we call agriculture or even grain growing. All this would imply that horticulture can only receive its best development in a highly civilized country and under favorable conditions. This is so true that in many highly civilized countries, where agriculture is well established, horticulture has not been greatly developed. A roving people have neither time or inclination to devote time and energies in developing horticultural plans. It is only after stability comes, after the absolutely necessary things are provided, that horticulture has much hold on a people, and only after these necessary things are provided can we expect much in the way of the finer lines of horticulture, which includes floriculture.

It may be argued that fruits and flowers are necessities. In so far as happiness and pleasure are concerned this may be true, in fact is true, but the fact that people live and thrive without fruits and flowers proves that they are not necessary to life, even though they promote health. It is true that horticulture is necessary to proper home-building, home comforts and home pleasures, but we must remember that more than half of the population of the world pay little or no attention to adornment of home, in fact, know no luxuries and, in fact, are without the common comforts of life and

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have little conception of anything more than merely to obtain the things that prolong or sustain life. With this thought in mind it is easy to see that only those who have permanent homes, who have time aside from mere existence, who have tastes and conceptions of something better than mere animal life, can be expected to engage in what we, as fruit growers, denominate horticulture. With this thought in mind it would be easy to suggest another division between agricul ure and horticulture, and that would be: That agriculture is that which, in the development of civilization provides for the necessities of life, while horticulture is that which gratifies our tastes, ornaments our homes and conduces to our pleasures.

If this last view is taken then we begin to consider that agriculture may be a good thing; is really a good thing, in fact an absolute necessity to present human life and advancement. It not only provides provisions for sustenance but enables us to provide for an accumulation, either of the direct results of agriculture or to convert into some other form for future use. This is not only the present condition but it seems that such conditions existed long ago, for we read of a man who had great crops and concluded to tear down his barns and build greater and store up the crops for future use, and then he concluded that he had plenty, and he said: "Soul thou hast much goods laid up for many years; take thine ease, eat, drink and be merry." The condemnation passed on the man in question was not because he had laid up of the wealth of this world, but that he had neglected the better part. Horticulturists do not do this. In fact, before a man or women can become a horticulturist, in spirit and in reality, there must be the desire for something better than mere living; there must be a love of the beautiful; a desire to enjoy some of the higher and better things of life; and the flowers, clothed in their beautiful colors and loaded with their fragrance suggest better thoughts, better actions and conduce to nobler living. So, in civilized countries, we see that horticulture and agriculture are necessarily closely, if not inseperably connected and the grade of civilization and advancement can be fairly determined by the condition of horticultural development or advancement.

There is no conflict between agriculture and horticulture, and while agriculture is the basis of our wealth, let us consider that horticulture is one of the chief agents in promoting our happiness.

NEW FRUIT AND EXPERIMENTS.

BY G. MILLER, ANITA.

To confine a man to 200 words, is like waking him up and then putting him to sleep again before he has a chance to rub his eyes clean. I therefore presume, that our worthy secretary meant 2,000 words instead.

I hereby send you a few samples of a new Iowa chance seedling. Until a few years ago, it has been passing under the name of Baldwin. While it has not been any discredit to that name, it, as an annual and profuse bearer, crowded the Ben Davis from its seat of honor. The surplus of this apple has been regularly purchased by the same party at an advanced price of fifty cents a bushel over other varieties. The tree has suffered some during the

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winter of 1898-99, which accounts for the fruit being much reduced in size. While the tree is advanced in years, it has made considerable new growth the past season. I have written in regard to this apple to Col. G.B. Brackett, United States Pomologist, to see if he would be able to place this apple among our standards, but so far it has remained unanswered, and other expert judges of the United States claim it to be none of our standard sorts.

Years ago, I selected out of 2,000 plum seedlings, twenty specimens, and transplanted them on my home grounds; six out of the twenty prove to be good plums, two of which, are in my estimation, equal if not superior to the De Soto. One is an early plum, a sample of which I submitted to Prof. Budd, the other is a very late plum (season Miner) with a rather mushy, agreeable flavor. It has no astringency whatever, even when cooked with the skin on. It has then a decided apricot taste.

With the fourteen inferior plums I made experiments by top-grafting with Wyant and De Soto, principally with Wyant. When two years old the scoins were literally a solid mass of plums; on some trees they would be smaller, on other trees the size would be greatly enhanced, regardless of the quantity. The difference was so striking that I have come to the conclusion it was not accidental, that when there was similarity in the leaf the size increased, and when of a different type they decreased. If this should prove to be true we are necessarily hemmed in by the retrogradations of seedlings, and we cannot over-step that limit.

Would not perhaps, some of the planted seed of the Wyant plum or any other enhanced in size by the infusion of stronger blood, bring forth new varieties larger in size than we could obtain by merely crossing the blossom alone, and does not nature indicate to us a thorough fertilization and perfect crosses by the superior specimens of fruit?

The up-to-date Iowa nurserymen should become proficient in the art of selecting seedlings worthy of trial from the inferior ones, by the leaf, wood and general appearance of the tree. By this method I have now a two year apple seedling that all of you would call a Ben Davis, if any thing, it is a cleaner cut tree, and I feel proud of the acquisition.

While in Des Moines, during the state fair, I had the pleasure of listening to a talk by Secretary Bomberger, on top-working by budding; while I admired his patience, I did not agree with his theory. A natural bud reaches to the heart of the wood. An inserted bud has not that tenacity, when it becomes a limb laden with fruit it is liable to tear loose from the tree. I presume from his talk, for most people it is a hard matter to make grafts grow. With good scions and a healthy tree, every graft should grow. Take four pounds of beeswax, two pounds of rosin, one pound of tallow melted together; when well heated pour a small quantity into cold water and kneed until it has obtained the proper consistency. In an ordinary warm day the wax is sufficiently plastic to be used without artificial heating. Do not grease your hands while using it for if you get any grease on the fresh cut scion, it interfers with the union. Should there be propolis in the wax, use less rosin. Should the limb be of considerable size, split it as little as you can, on the side toward you, after having tapered the scion downward and inward, insert the little blade of your knife in the cut, giving it a gradual twisting motion while forcing in the scion, wax thoroughly without tying, then wrap a small piece of white cotton cloth over the wax to

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prevent the sun from melting it. A fresh cut limb should not be exposed to the air and sun any longer than it takes to perform the operation. This wax as I make it will never crack until the scion expands it. It is a bad practice to steady the limb with one's hand for sometimes the knife will slip after passing a curl in the wood and a badly gashed hand is the result.

This summer I had apples on two year old scions, on Whitney, Duchess and Skrischapfel, with very peculiar results, on account, I presume, of the original foliage being predominant. Last spring I had top-grafted on one year old Whitney, two inches above the ground and received a new growth averaging from five to six feet, giving me from ten inches to one foot of Whitney wood. I am growing these trees for my own planting.

W. M. BOMBERGER: Mr. Miller brought a sweet wild crab to the Iowa State Fair that attracted some attention—a wild crab that was of good size and as sweet as an ordinary sweet apple. Leaves and wood of tree apparently a wild crab.

The seedling apple sent was not received in time to be taken to the meeting. Following is description: In general make-up it has some resemblance to the Baldwin, yet is shaped and looks some like Lawver; not quite so red, dull red with stripes; russet around stem, calix very shallow; medium size, flat; some specimens roundish, covered regularly with white spots; skin tender, easily bruised; keeping qualities and texture good, greenish, considerable juciness; reminding somewhat of the flavor and texture of Early Joe. Flavor good, something like a mingling of Baldwin and Early Joe. While the color is not so good it makes a very desirable sort.

O. J. GIBSON: Gentlemen of Southwestern Iowa Horticultural Society, as a representative of the Commercial Club, of Red Oak, Iowa, I extend to you all, as a body and as individuals, to select the city of Red Oak for the next place of your annual meeting. It has been many years since we have been favored with a meeting of your society, and we extend to you a most cordial invitation.

TRANSPORTATION.

BY W. J. DAVENPORT, COUNCIL BLUFFS.

Horticultural societies have their meetings for the purpose of discussing various subjects such as the relation of agriculture to horticulture; how can certain conditions be applied in a practical manner; new experiments; beautifying home surroundings; meeting newer conditions; how is commercial fruit growing best made a success; how to best dispose of the products of the orchard; and many other subjects mentioned in the program gotten

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out for this occasion, all with a view of making general conditions of horticulture better and more profitable. Your strongest efforts will be in the direction of bettering the quality of fruit offered on the market and preparing to meet certain competition both in regard to quantity and quality, believing that the better the goods offered, the easier it will be to meet competition, and the committee having charge of your program must have had in mind that the best results cannot be attained without good transportation. Also that this subject is one of much importance and I am pleased to know that they gave it a place on the program, but why I was selected to address you on this subject I probably will never know. There can be no doubt about the railroads of this country being interested in the business you are here to discuss, for in the past ten years the revenue derived from the transportation of fruit of all kinds has been very great, and the line I represent probably has received more benefit from this class of business than any other two lines west of Chicago. Members of the Southwestern Iowa Horticultural Society meet once a year to consult together for a purpose, which is to improve conditions: In like manner the heads of the traffic departments of the various railroads of the country call their general representatives together at different times for the same purpose. The only commodity a railroad company has to sell is transportation and the better it can be made, the more demand there will be for it, and the one that can offer the best goods at even money is the one which will have the largest sales and if the quality holds good, the sales will increase, and as soon as a competitor finds that his neighbor is selling more transportation than he is, he begins to investigate and if his transportation is not of as good quality, he goes about it to make it better. For many years past there has been great strife among the railroads of the country, each trying to improve the quality of goods they have to sell in order to attract the attention of those who want to buy, believing that good transportation, like good apples, will sell readily, and in large quantities. Those who have watched the progress made by transportation lines in the past fifteen years will regard the improvement as phenomenal. Distance has been eliminated by time and nearly all railroads now perform a given service in less than half the time required some years ago and at a greatly reduced cost to the shipper, and I believe that no railroad in the west has made greater progress in this direction than the one I have the honor and pleasure to represent, and I also believe that there is no class of shippers who appreciate these better conditions to a greater extent than do the producers and shippers of all classes of perishable property. Not only do the railroads handle your apples more quickly and at less expense to you than in former years, but they also provide the very best conveniences, such as refrigerator cars to keep your apples cool in warm weather, and warm in cold weather.

The word "transportation" carries with it a greater meaning than the mere moving of freight or passengers from one point to another. The planting of the best tree you can find does not alone insure your getting a perfect apple. That result can only be obtained by first planting a perfect tree, then taking good care of it, and you will either attend to the tree personally or select a competent person to do so for you. So in the handling of transportation, after it has been manufactured. The parts are intricate, and are carefully adjusted, each fitting into the other in perfect harmony, and they

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must be kept in that condition, otherwise, the goods will lose their beauty and fail to attract the attention of purchasers, and in order to keep the factory going to its full capacity, and all the while turning out the best goods on the market, the owners of the railroads select experienced men to manufacture and place upon the market the only commodity they have for sale, "transportation," and in selling it, it is as necessary that the salesman should be as gentlemanly and courteous to the public as are those who are selling goods over the counter, or in any other manner disposing of them, making the purchaser feel that he is at home and among friends. I believe you all notice that fewer differences exist between the purchasers and sellers of transportation at this time than in the earlier days of railroading, all of which is very gratifying to all parties interested, and I believe you have also noticed that when differences do arise, they are more easily adjusted than formerly, which proves that the seller and buyer of transportation are getting closer together and that each has greater confidence in the other than in former years.

Great efforts have been made by the Southwestern Iowa Horticultural Society in the past ten years, and soon it will seem as if the greatest possible results have been attained, but you will go on and on until the whole world knows that the best apples on earth are grown in Southwestern Iowa, and all this will have been accomplished through the persistent efforts of your association and the officers you elect from time to time to manage its affairs, and in like manner will the officers of the railroads go on and on in their efforts to produce a quality of transportation which will be as attractive to the public as the great red apples of Southwestern Iowa are to tens of thouands who will stand ready to buy them as fast as you can produce them.

SILAS WILSON: I desire to commend this paper and the spirit shown by Mr. Davenport, to come among us and gives us a word of encouragement and help us to get a better understanding of each other's work. It is a good plan to get closer together, understand each other and work together. If there is any difficulty it comes from misunderstanding, and Mr. Davenport's friendly little talk will straighten out matters.

W. J. DAVENPORT: While I have association with transportation matters, I can assure you I am personally interested in horticultural work on my land in Mills county. I am here as a learner and assure you that I enjoy these gatherings and am here to learn to grow fruit.

HOW TO GROW STRAWBERRIES.

BY R. D. MCGEEHON, ATLANTIC.

Any land that will produce a good crop of corn will produce a fair crop of strawberries, but if you want a larger crop of large berries you want the richest soil you can get, and the best of cultivation. The plants need plenty plant

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food and moisture; choose level land, or nearly so, but low bottom land is subject to frost. Don't plant near shade trees as they absorb the moisture and rob the plants of plant food. Plow your ground in the fall, if it is a deep rich soil, plow it deep, about eight inches. During the winter cover it with well-rotted manure, one good two-horse wagon load to every six square rods. In the spring as soon as the ground is in good condition to work, go on it with a disc harrow and give it a thorough cultivation both ways with this, then take a smoothing harrow and harrow it about four times as much as you would if you were putting in a crop of wheat; then go over it with planker or roller until you have it as smooth as a floor and top soil firm. Make shallow straight marks three feet nine inches apart and put plants two feet apart in row. Plant nothing but good, strong, healthy plants of previous season's growth. See that the soil is well firmed around the roots of plants and that the crown of plant is level with the top of soil.

The best time to plant is as soon as growth has fairly started, or about the time the new leaves on plants are as large as a squirrel's ear. I always shorten the roots to about four inches before planting; as soon as we are done planting we start cultivator and hoe. Planet Junior, twelve tooth cultivator, or the Breed Weeder are about the best tools I have tried. Go over them once every ten days; always cultivate as soon after a rain as the soil will admit. Keep cultivating until middle of August or first of September two to three inches is deep enough to cultivate. When runners start place them along the row (in line of plants set) be sure that the soil is as low or a little lower where new plants in place than the old plants. Place a small clod on it to hold it until it takes root; by keeping your first runners all in the line of row you will soon have the spaces between plants filled with new plants, and have a continuous matted row. Now, if you want fruit of good size and quality, you should use some care in distributing your runners. Don't allow them to mat too thick, for such varieties as Wood, Warfield, Crescent, and others that make large quantities of runners would cover the entire ground and in many places be entirely too thick to produce good fruit, if it should be a wet season and favorable for plant growth, while if a dry season you will not get more plants than you want. Four inches between each plant in row and rows, when growth is done, eighteen to twenty-four inches wide, produce the most and best fruit, if you plant such varieties as Parker Earle and Bubach; twelve to 15 inches apart is most too close.

If you are planting a small patch for family use, say, 300 to 500 plants, I would plant about 100 in a row so as to get as long rows as I could to be convenient to use cultivator. As soon as cold weather sets in mulch the entire patch with clean straw or prairie hay; we use from three to four two-horse wagon loads an acre. As soon as growth starts in spring remove the principal part of mulching of the plants and put it between the rows, leaving enough in the row to keep the fruit off the ground. Plant at least two rows of staminate to every four rows of pistilate; or just for a family garden I believe I would plant all staminate, or perfect blossoming varieties, as we now have some that are about equal in all points for a family berry to any of the pistilates. The best well tested staminates for us is Wood, Lovett, and Clyde, the latter I have tested for three years and if it continues to do as well as it has done I will have give it the head of the list. The best well tested pistilates is Warfield, Bisel, and Crescent, and were I planting a bed

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for family use I would make my selection out of these six varieties. If I felt like experimenting a little I would plant a few Senator Dunlap, and Nick Ohmer, both these have perfect blossoms and will bear full crops alone. Senator Dunlap is of the Warfield type, medium size, firm, handsome, good quality, and very productive. Nick Ohmer, very large, handsome, good quality, and fairly productive, fifteen berries of Nick Ohmer have been grown that filled a quart box.

This is a mere sketch of how to grow strawberries; to give statement of all the different requirements and the reasons for each, would make a small book; the grower must use common sense and good judgment, the same as in growing any other farm crop.

I will give a few hints as to what to do, and what not to do. Keep the roots of your plants after they are dug out of sun and wind; keep them moist or wet, until safely planted; plant in best possible manner for them to grow. Stir the ground between plants often, keep it perfectly mellow and loose for two or three inches deep, if there are too many runners to make rows twenty to twenty-four inches wide, and allowing four inches square to each plant, cut them off, mulch as soon as killing frost comes, covering plants as well as ground between rows out of sight, rake off the row all but the fine mulching, or in other words leave on plants all they will nicely come through; do this as soon as growth starts in spring. There is no danger of putting on too much mulching if it is taken off as soon as growth starts. The best land for strawberries is a dark, sandy loam, where potatoes have been grown the previous year. Fall plow it after potatoes are dug and manure it heavily in fall or winter with well-rooted manure. Our best growers recommend from twenty-five to seventy-five two-horse wagon loads an acre. I have used forty an acre on soil good enough to grow seventy-five to eighty bushels of corn, and had good results. Pick off all blossoms the first season; don't allow the plants set to bear. Strawberries should always follow some hoed crop. Every experienced grower says plant early in spring for success.

W. GREENE: Brunette and Brandywine for size and quality are excellent berries for the home garden. Bubach No. 5 pollenized by Jessie makes a good combination for size, the Cumberland is also a large berry, but these are not so high in quality. What is needed in the home garden are berries of large size and good quality rather than quantity and shipping qualities so much sought after by the commercial grower.

I. M. NEEDLES: In the main I agree with the paper just read, but would not want the matted rows so wide so that the fruit would be larger. I want the sun to get to the berries to increase the color and firmness. I would prefer rows eight to twelve inches wide rather than eighteen to twenty-four inches. The Warfield that Mr. Greene objects to is very good if left until it is blood red and very ripe.

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JAMES FIELD: The Wood is not so good here. The Splendid is one of our best.

G. F. FRITCH: Best is the Clyde on my place now, better than Wood, which is good; better than Warfield or Crescent. The time to pick berries is when they are ripe and you can get at them. If a crop is on hand you can not be too particular to get them in good condition, as friend Needles refers to. Glen Mary did well, Wm. Belt was no good at all this year.

THINNING PLANTS, HOW AND WHEN SHOULD IT BE DONE?

W. J. DANENPORT: I have topped the market with berries, that are indifferently spoken of here, grown on Mills county land.

I. M. NEEDLES: I advise thinning while cultivating the rows.

GEO. H. CASTLE: I have tried to make thinning and even distribution of plants in matted rows in this way with success: first take all early runners off until July 1st, or a little later; then after the plant forms a stocky growth let it send out runners. These runners will not be so numerous; are more vigorous and will produce stronger plants. We find this set of runners will set less plants.

W. GREENE: Should drought set in then there would be a poor stand.

JAMES MCGINNIS: While we are talking of the hardships of raising berries we should not forget the pleasure of eating them. There is good money in raising first class strawberries. We use good timber soil; principally that which is at the bottom of ravines. Warfield, Wood, Crescent; Manchester, Brandywine are what we have grown the last year, though it was not a good one for berries. Sold last season from $10.00 to $40.00 worth a day for about four weeks. This is not so much as it would have been had the conditions been better. An acre and a half of raspberries and the same of strawberries yielded me over $400 00 worth of fruit. I think it pays well to grow small fruit. Location preferred is timber soil and northeast slope.

ELDER RHODES: We hear nothing about the worst side of fruit growing in this talk. I planted with great care a nice plat, got a good growth then the grubs eat all the plants.

JAMES MCGINNIS: If the ground is very rich it is best to keep manure off, this lessens danger from insect pests, especially grubs.

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W. GREENE: In the eastern part of the state the leaf-roller is the worst enemy the strawberry grower has to contend with. Burning over old beds and spraying are the methods used in getting rid of them.

IRA M. NEEDLES- Mulching with stable manure can be done early, very early if the mulching is hauled in a strip between the rows and not spread all over at once, at the approach of freezing up or after that it can be widened, but plants in matted rows can be lightly covered with straw. I have found this the best way to mulch. Heavy mulch, between rows holds moisture, and holds it well and there is a marked difference over the fruiting capacity of beds so mulched, seemingly, over those mulched in the usual way.

G. F. FRITCH: If you plow in spring and turn under trash or manure your patch will be troubled with grubs. Plow in fall and turn under clean soil.

FLORAL DECORATIONS.

BY W. GREENE, DAVENPORT.

Flowers have been used since the time when the mind of man runneth not to the contrary, to decorate the person, ornament his dwelling, or embellish private and public grounds and places of assembly.

The essential element in floral decorative work is to so arrange flowers that they will add beauty to the object or place sought to be improved in attractiveness by their use. However elaborate the plan may be it should never suggest the labor required to execute it. Simplicity is the key which unlocks the doors of art as well as nature. The greatest truths are uttered in simple words, and the most sublime thoughts in short sentences.

It is not necessary to have costly material to work with, but to so use that which you have at your disposal to produce a pleasing effect. We should take into consideration, in making up any decoration, the size, form, color and texture of the flowers, as well as that of the foliage of the plants, to secure the proper adjustment in regard to harmony with each other and the place they are to occupy.

Much improvement has been made in the last quarter of a century in the arrangement of cut flowers in boquets and designs, and the limit has not yet been reached, for many devices are still employed which hardly suggest the most refined taste as to the proper use of flowers. But we do not care to criticise what may appear crude, or be the result of inexperience, but rather to suggest to those seeking information, something that might be helpful in this line of work.

The limits of this paper will only permit a cursory glance at the material and its arrangement on all occasions that may arise in the decoration of the

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person, the dwelling, which includes the home life as well as many public functions which occur in it, and places of public assembly.

For personal adornment there is the botonniere, corsage and hand bouquet. These may be of a single flower or a bunch of them with their own foliage or that of some other, with suitable texture. The best for this purpose, however, are those which, after cutting, do not wilt soon from exposure without moisture.

The old hand bouquet with its fill of tissue paper has given place to a simple bunch deftly tied with ribbons. Perhaps this fad sometimes runs to the other extreme and we see more ribbon than flowers. But good sense commends a simple bunch of flowers, and it might be well to add that a less number of varieties is better than to have many colors represented in it.

Many of you may recall incidents when in your "teens" of giving and receiving flowers which are still among the most pleasant recollections of youth, and mayhap some old book still holds the frail mementos of that time.

Flowers add much to the enjoyment of life. In the decoration of our apartments they contribute to our happiness. A bunch of violets, nasturtiums, or sweet peas, on the dining table, may, when placed there by loving hands, often make a feast of the plainest food and supply nourishment that was more needful than that of bread and butter.

In the home life there are also semi-public occasions which call for the use of flowers. Weddings occur, parties come aud funerals happen, each of which touches our natuers very closely and find an appropriate expression in the use of flowers. Plants are much in demand for such occasions and add to the attractiveness of the decorations. Cut flowers in vases and baskets will always find a place. To attempt to describe a decoration would be useless, as each event will suggest something appropriate under the circumstances attending it. When plants are used, select those which harmonize in habit of growth and foliage. Hard, smooth leaves should not be brought in close contact with those of a soft, tomentose texture any more than colors which are not complementary should be brought together, but intermediate forms and colors should be employed to tone down violent contrasts to make the effect more pleasing.

Among decorative plants, Kantias and Areca palms are much sought after for this purpose. When specimen plants are used they should be placed in jardinieres. It is better to use a less number, and have them shown to the best possible advantage, than to have a larger number of plants in a less attractive setting. While certain kind of plants are better suited for decorative purposes than others they are not always available, so we must learn to use to the best advantage the material we have.

For cut-flowers vases and baskets are always appropriate, either for table or mantel. Sprays of asparagus plumosa, or ferns, are frequently laid on the cloth where the feast is spread, and flowers are sometimes distributed in this manner, either as favors or as a part of the decoration, and often these are in a single color.

But with all our joy there comes moments of sadness when a funeral must be arranged for. Much has been said in regard to the use and abuse of flowers at this sad event. The wire design, while useful, has been abused. Their beauty depends upon the skill with which they are "made up." Some

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of these when finished are not more attractive than if they had been cut from a board, while under the direction of a skillful artist the same design becomes a thing of beauty.

At the grave much may be done to soften down that stern reality—earth to earth and dust to dust. To make the transition as pleasant as possible the pile of fresh earth can be hidden from view with evergreen boughs, and the sides of the grave lined with white cloth and decorated with sprays of evergreen and flowers, held in place with wire staples. So treated the place is less repulsive and our thoughts of it will leave in the memory more agreeable recollections of the last parting with loved ones.

Many public festivals occur in church and hall where flowers may be used to make the event more enjoyable; at Easter tide, and on Decoration day, at Christmas and on the New Year, garlands are woven and festoons hung, and who would forego the pleasure of such an occasion.

At Christmas time holly, with its bright red berries, is much in evidence as sprays and wreaths.

For festoons Arbor Vitæ is the best evergreen, and can always be had when wanted. In large decorations oak leaves are frequently used, and the wild smilax from the South has many admirers at the North. For finer work smilax and asparagus plumosa are still grown in great quantity for that purpose. Each season furnishes its own favorites, but roses and carnations are always obtainable when other flowers are scare.

W. M. BOMBERGER. This is out of our line of work, but we have been called at times to decorate and it must generally be done in a hurry. We have found that where rooms are decorated for festive occasions if walls are white, possibly much foliage can be used with effect. The rose leaf is very pretty, we found by test that if branches are used in quantity from rose bushes on a pure white wall, fastened on with pins here and there irregularly; a room so decorated even to pinning and weaving them over lace curtains it has an admirably effect. With pins they can be fastened over and around doorways and grouped in little sprays carelessly every where. The use of autumn leaves on white back-ground with sprays of red berries make a fine effect The new memorial rose, Wichurinna, is a very clean delicate grower and these delicate vines pinned on lace curtains are as pretty a thing as one can look at. The rose leaf and vine of this trailer is as delicate as lace itself.

PRESIDENT'S ADDRESS.

BY J. P. JACKSON, GLENWOOD.

Fellow members of the Southwestern Horticultural Society, and co-workers:

We have again come together in the interests of horticulture in Southwest Iowa, to confer and devise ways and means whereby we may be benefited collectively and individually. Collectively, because in union there is

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strength, and the more strength we have, as a society, the better we are able to bring out and mature plans that will better our condition as individuals. We must admit that man is by nature more or less selfish, and if it was not for the fact that he expects to gain in the end, he would not be so ready to impart to others the knowledge he has gained by his own experience. We have therefore come together to compare notes and give our experiences of the past year, that we may be more or less benefited by discussing the successes and failures of others. The season of 1900 has been a peculiar year—full of surprises. Early in the season all were much elated over the bright outlook for an apple crop, but as the season advanced the prospect began to grow dim and at harvest time we had nothing to gather, comparatively speaking. We are much discouraged at times, and perhaps the thought has come to us—is it worth while? Is not the fruit industry, in a measure, a failure? And in fact, it has been remarked to me repeatedly that this is not a fruit country. As we are so apt to dwell on the failures and forget the successes, permit me here to introduce a little evidence, merely as a reminder, we have had at the institution at Glenwood about fifteen acres of old orchard which includes about five acres that has come into bearing in the last six years. In 1891 I began to keep a record of the number of bushels of apples harvested. Have kept it up each year since, and here are the figures:

1891 crop	1,862 bushels
1892 crop	none.
1893 crop	548 bushels
1894 crop	452 bushels
1895 crop	1,850 bushels
1896 crop	736 bushels
1897 crop	1,080 bushels
1898 crop	80 bushels
1899 crop	1,353 bushels
1890 crop	503 bushels

Does this look like apple growing in southwest Iowa was a failure? These figures show an aggregate of 8,264 bushels of apples produced from fifteen acres of ground in ten years, and figuring them at 40 cents a bushel gives the net sum of $3,305.60. No doubt every one connected with this society farms more or less, and produces corn. Now take fifteen acres of corn at fifty bushels per acre for ten years, will give 7,500 bushels; figured at 25 cents, will amount to $1,875. A balance in favor of the orchard of $1,430.60. Is there one man here that would say southwest Iowa is not a corn country? And yet we have all seen very discouraging crops and prices also. Why not all concede the facts and stand by Iowa as a fruit country.

I wish to impress upon the mind of every member of this society the fact that we are what we make ourselves as a society, and as citizens also. The life of this society and of horticulture in southwest Iowa depends upon our efforts as individual members, so let us enter the new year with renewed zeal and with a fixed determination to bring all lines of horticulture to the front, and to this end I wish to recommend that this society issue a short treatise each month on some appropriate subject and send to the county papers for publication, that the masses throughout the district may become familiar

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with our work and if possible become interested. This may be done by a committee appointed for this purpose to select the member and the topic to be published; for example, the first week in April send out how to prepare ground, plant and grow strawberries, and so on through the season. I believe this could be done with very little expense to the society. I also wish to urge upon each member the necessity of interesting the young men in horticultural work. Unless we look well to this, a few years more will see us retrograding as a society, and we will drop into comparative obscurity. I further recommend that this society keep the matter of planting and propagating new and promising seedlings well in view, as I believe much of the horticultural future depends on this line of work.

In conclusion, I hope this society will recommend practical spraying, for I believe this should be considered as much a part of the season's work as cultivation. It has been proven beyond a reasonable doubt that this line of work is necessary. I have followed it for the past eight years, and am thoroughly convinced of its beneficial effects, having tested it in various ways. I find that almost every state has carried on spraying experiments, and in nine tests out of ten they have proven successful. I also find that Canada is far ahead of us in this line of work, having thirty-four stations in the Province of Ontario alone where regular spraying tests are carried on. So let us be up and doing, and not fall behind our neighbors in the world's progress.

SECRETARY'S REPORT.

BY W. M. BOMBERGER, HARLAN.

Greater interest and activity is now possible under newer conditions. When the old has passed away and all things and opportunities are new we can make the new better; the very rubbish of the past even serves for a solider foundation. In building anew we know our material better, after going through the fire of experience, and test of storm that has not only tried plant life, but has tried man.

The recent Charlestown-like destruction, that has swept over southwestern Iowa experiences now affords an opportunity. There are many things we cannot explain, but there is no time now for that, or to exploit theories or try them, or rejoice in success in going through the crisis safely, if such has been the case, nor is there time now to mourn over losses. Now is the time for action. Never has opportunity been greater for growing the apple, cherry, plum, peach, grape and small fruits. We know what we can do and what is possible and best o do. Never has opportunity been greater for profitable expenditure of effort and money in growing fruit and doing horticultural work, so as to make it a delightful, refined work and a good paying investment. Never has there been richer and more available experiences for fruit growing at the command of the planting and growing public. How to prune, dress, cultivate, give seasonable management, to gather, sort, market or store for future sale, are facts well known and well established, and the prices firm and the markets good, and not glutted.

But above all things in this work, what we now need is wisdom—wisdom in action, word, deed, and now is the time to use descretion and the best and most infalable human judgment.

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Constancy and staying qualities in horticultural character and work need to be more deeply fixed in all of us and in our work. Extremes, possible, from climatic conditions often creep into our work causing deviation from the original plan and intent that has been well laid. Jumping from one point of operation to another is a great mistake. Know yourself and stick to your plans and make them a great forceful and effective work. Be a factor that will make success. The quality of character that does not drift with the crowd is not so very pleasant and it generally takes the nerve that is a little related to the crank to figure the hardest on the other side of the ledger, on the probabilities of loss and to figure as hard on the risks as on the profits.

This section of the state will wake up some beautiful autumn morning and pocket prodigeous profits on apple orcharding. Then the folly of present indifference and lack of interest and poor care of trees will be seen. It is easy then to jump into the work and over do it and plant, and invest money and risk large efforts, and make large credits in and for commercial fruit growing. Now after a cleaning out and after discouragement the indifferent and easily discouraged speculator is scared out, is the time to do conservative work in orcharding. Trees should have better care, and not indifference as now. Good apple years will come and every dollars worth of work and care on trees that are left, and orchard plots in bearing, will be amply repaid. Great profits are possible—in a single season as much as $300 an acre has been grown on choice locations and it will occur again. Apples will always pay, and commercial orcharding will be a feature of our work in southwestern Iowa, that has a great future. We are neither too far south or north; are not so liable to extremes in damages from insects and fungus or the extreme cold and tempest; risks are reduced to a much greater degree with us here than either in the north or south. Very late keeping apples and their storage is not possible in the south, and there is no high quality of fruit in the north that can be kept any length of time. With these facts in view, we should appreciate every fruiting tree, orchard, or fragment of an orchard that has been saved. We are satisfied that indifference and neglect now will be regretted and that it will result in great loss. There will come a time when man imbued with the right spirit of orcharding, that has stood through thick and thin, will reap a large crop, and his neighbors will regret that they had not given greater care to their orchards.

Another year has only demonstrated the utter destruction of vineyards and grape vines. In southwestern Iowa the grape has been largely destroyed, excepting a few favored spots, and the whole territory needs to be replanted, and the past summer has shown how severe the trial of the test winter was on the remnant that was left. In many cases after being weakened by the test winter, the remnant, after giving a final crop a year ago, did not leaf out this spring, which only made the destruction more complete.

The plum and cherry did not fare so badly, but enough is known to give us safe ground on which to work. The peach, while being utterly destroyed in some localities, where planted in protected places and where the snows drifted so as to make a good winter blanket, trees were saved even through that test winter, and there is still a future for peach growing in many places in Iowa. Small fruits are rapidly being replanted, and this will soon be a large, profitable and remunerative work. The growing of the grape, black-

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berry, raspberry and strawberry will always be so, as a market can always be worked up for choice, selected fruit for house to house delivery. Trade of this character is such that no commercial shippers can touch it at all. Such markets at the very door of every person that is a fruit grower, should be looked after and supplied. Right here are opportunities for hundreds and hundreds of enterprising young men and farmers of limited acreage around our cities and towns. Trade of this character will reach farms and the readiest purchasers can be found for large quantities of choice berries, grapes, and small fruits of all kinds.

This society is out of its "teens." It has passed through a quarter of a century of experience. We have gone through the experimental stage and should now avail ourselves of what we have learned and of this dearly bought experience. Pressing the claims and careful consideration of this valuable experience on the people is the largest share of the mission of this society. We should make that experience felt on the owner of every farm and town lot.

Ornamentation, floriculture, vegetable gardening, landscape effect, tasteful arrangement of grounds, farm vineyards, farm orchards, of the many tree fruits is a wide field. The richest and most dearly bought experiences should be poured into every avenue possible to reach the home maker and planter. If we give them the best we have learned, and turn information back that has been gotten by the sweat and blood, through tempest, storm and fire, and with the use of the best information that we can give to them they will make mistakes enough. We should be helpful in this wide field. We should place the right kind of information where it belongs, in every home, with reference only to the successful operation of this great work that we have on our hands. If there are good, well planted homes scattered here and there in every county, other planters and home makers who are not so successful need to be reminded how much tree and plant life can do to make the ideal and useful home. The successful experiences should be gathered and turned back to where they belong, and where they will be helpful.

This society is an auxiliary to the Iowa State Horticultural Society; has for many years received financial support from the parent organization, but this season the state society has added a generous increase to our support. It behooves us through proper channels, to make a proper acknowledgment of this added kindness, and this generosity places greater obligations on us as one of the auxiliary societies; hence, we should widen our efforts for usefulness and extend our annual membership list and do a greater work. I should urge the appointment of a committee to give this matter consideration, so that it could report back to this session, giving the society an opportunity to discuss openly and freely, methods and ways and means of doing the work. I am safe in saying that in all the United States there is no section, for the size, that has a higher standard of intelligence or a better appreciation of that which is wise or good in giving an uplift to agriculture, in any of its branches and a higher plane of operation than Southwestern Iowa. Our farmers and fruit growers and all connected with the work will be quick to appreciate and to work in proper lines if given proper and correct information. We, as educators, should make this influence felt somewhere, by every farmer, his wife, his children, and his very flocks and herds. While farmers are thinking out their problems and making well laid plans for their homes, our ideas of tree and plant life

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should share in these plans, and can be made to contribute much of pleasure, comfort and health to the whole farm.

The wide expanse of horizon and the boundless unfolding of Western Iowa prairies have an expanding influence on mind and human effort, but should be used only to develop that power in man of which they are capable of mastery. It is our duty to only work in proper channels and to be satisfied with proper limitations, and neither lead us as workers, or the public, into doing foolish things or overdoing what should be done on limited lines.

As we stand at the threshold of the year 1901, we are imbued with that hopefulness that should ever inspire the brave and strong heart.

We hope the year has the promise of much in it for all, and that you will be inspired with full confidence in your work. Let your work bless all whom it touches. As a common calamity has given us all a touch of closer feeling of brotherhood, so make it your mission everywhere to bring the blessings that flowers, fruits and trees can contribute to all who do not really know their benificent influence in home life. Let not the Southwestern Iowa Horticultural Society be satisfied with its work until it has not only dropped its flowers in every hand clasped in death, in this district, but wreathed the doors of every cottage of the humble and the home of the rich, and shaded the homes and protected the flocks on every farm, and given every man, woman and child all the fruit for food they want.

Yet, ladies and gentlemen, this is only the material side. The great Teacher gives out his most beautiful thoughts in their highest expression to us who work among flowers, fruits, trees and plant life. There is a varied language within that touches themes such as are caught by Wordsworth, Burns, Tennyson, and Bryant; they widen life and immortal hope, they teach power, faith, constancy, purity of life and its sublime sacredness, that will satisfy the out-reaching of every soul for a better, nobler and more divine life.

TREASURER'S REPORT.

IRA M. NEEDLES, In account with Southwestern Iowa Horticultural Society:

RECEIPTS.

1899.		
December 18.	To cash on hand	$ 237.73
December 28.	To cash, membership fees	42.00
1900.		
November 22.	To cash from State Society	150.00
	Total	$ 429.73

DISBURSEMENTS.

1899.		
December 21.	Paid B. Stewart	$ 24.80
December 21.	Paid J. B. Jackson	16.60
December 21.	Paid A. B. Case	5.00
December 21.	Paid hotel bill for delegate	9.50
December 21.	Paid O. H. Barnhill, postage	.60
December 21.	Paid printing bill, Logan	2.45

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December 21.	Paid, stamps for secretary	$ 12.90
December 21.	Paid W. M. Bomberger, premium	3.00
December 21.	Paid printing bill for secretary	11.50
December 21.	Paid W. M. Bomberger, salary	100.00
December 21.	Paid Prof. John Craig, expense	8.96
December 21.	Paid envelopes	1.55
December 21.	Paid Conway & Shaw, printing	8.00
December 21.	Paid W. M. Bomberger, stamps	2.00
December 21.	Paid O. H. Barnhil, delegate to Nebraska meeting	6.80
December 21.	Paid O. H. Barnhill, for D. Mason	6.00
December 21.	Paid stamps and exchange	.45
	Total	$ 220.11
	Cash on hand	209.62

I. M. NEEDLES: I wish to speak of memberships. They cost only a dollar, and this large report of great value is thrown in free; no one present can afford to miss joining this society; we need more members and we can do you good.

D. B. MCCALLA: I think that the best money I ever expended is what I have put in these reports and memberships. I have had success with the guide of these volumes and prize them highly.

Entertainment was given on Tuesday evening to the society in the city hall.

WEDNESDAY MORNING.

Historical reminiscences were given by W. B. Laughlin, of College Springs.

I commenced horticultural work in Illinois in 1853, when but a boy. We started west to settle somewhere and located where we now are. Then it was different from now. Mr. Van Zant was at Clarinda, Mr. Brown was at Tabor, and myself at College Springs. This was our numbers and personal as horticulturists in those days. To recount here all that this glorious section has gone through to the present day, is but to go over what is practically a transformation of a wilderness into a beautiful and well tilled prairie country, peopled with a high class of citizens. The war broke out and that was hard on us in many ways, with the test winters that came with that, my friend at Tabor had some trees left and he had so many dead trees to remove, they served to make a complete hedge around his nursery and place, against sheep that were then so largely herded on the prairies. The cottonwood was our beginning out here on the prairies and the

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change is so remarkable, improvements so great, this transformation cannot be described. This climate, like western politics, because of changeableness, has been hard on horticultural work. The trouble is, that trees too often get only a bad start and there is little effort made to make them do well from the start, and they are not looked after like an ordinary farm crop. More care would make fruit trees and orchards last longer. While this is so of the planter, the change that has come over the nursery business may have some influence, these may be good or bad, we will not discuss that, only give facts. There was a time when nursery trade and methods differed. Men did business at home with their neighbors. We have now the centralized methods that have come with quick transportation and the agent and plate book. New methods have their advantages with stock more centrally grown, and their disadvantages where so many are included in the work, before planters can get their trees. They find trouble with the labling; we do not say it is intentional, only somehow the farmer works for years and finds himself without results and not what he had bought, time all lost and they have practically thrown away years of work. I do not say that this is always the case. It is hard now to get an order of any size and get every item just what it is bought for, or every lable correct. So many hands, so many manipulations and so often a label slips. Development from smaller operations up to larger, as it is now, has been at expense of some good things, especially, correctness of label and correctness of work, a most vital part. Do not think that this is so by intention but we just give the facts as we now face them and as it is related to present horticultura effort and work. As to the future, we do not care to or feel able to predict. Some of us have traveled the journey so long that we can now see over the tree tops into the valley. But I have hopes for the best, and that this society will be a great help in the untried future.

D. B. McCALLA: We have in this time a great work, for sample; the value of the work this society can do in giving out complete directions as to handling injurious insects and fungi. Years ago we did not have to contend with such pests and noxious weeds as now, but we have better control and knowledge of them now and this last is our power and it is continually increasing.

W. B. LAUGHLIN: We knew well, Mr. J. M. Russell, of peach fame, in Nebraska, and his father; they were running a nursery in southern Illinois, and his father in winter time would go on

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horseback to Ohio and return with the horse laden with scions. He had started a nursery at Vandalia, Ill. My first stock came from Bureau county, Ill., went from Hennepin down the river to St. Louis and from there up the Missouri river, and the tree boxes were dumped on the sand at the nearest point, and hauled over to College Springs.

The following letters were read by the Secretary:

Mr. President and fellow members:

I offer an item on the history of fruit growing here. It commenced at Council Bluffs when none of us had had much experience, and that was backed by Nr. Longworth and Mr. Campbell, of Ohio. The latter introduced the Concord grape, which has proved to be the grape for the masses. Mr. Hussman, of Herman, Mo., adopted it after trying the Catawba and Isabella, and Mr. Longworth recommended the two last kinds to him. I got George Hussman's work on grape culture and studied it; the Concord was then just being introduced in the west. I obtained plants of it from Jimmie Smith, of Des Moines, and went at it in earnest in this city thirty-seven years ago, and as your Honorable Vice-President, Silas Wilson, and others know of my success, I will not speak further of that work.

I have this to give for the benefit of the young: Plant out something every few years, put out a new orchard every ten or fifteen years and you will always have good fruit, and will have some orchard trees that will be in their prime.

Gentlemen, I cannot be with you as much as I desire to be for my poor old wife is suffering with pain, and she has stayed and taken care of me for sixty-five years, so I think it is my duty to stay at home during this session and look after her for the few days we have here to live together. This is my reason for staying at home.

Would like so much to see you all once more, and hope you will have your meeting at this place next time so that I can get to see all my friends once more before I pass away. I am eighty-five years old and quite well. Fellow members, I commend you to God and the word of His grace which is able to build you up and make you to sit in Heavenly places in Christ Jesus.

A. S. BONHAM,

Council Bluffs, Iowa, December 18, 1900.

Mr. President and fellow members:

I thank you and the society for the kind invitation to take part in your meeting. I cannot write a paper nor even dictate one, as my head and body are most in a state of collapse. Hope to be better soon. I hope you will have a good and enjoyable meeting.

H. A. TERRY,

Crescent, Iowa, December 17, 1900.

Mr. President, Fellow Members:

I wish to thank you for the kind invitation to meet with you; send a few notes on the subject. My days of chasing around in winter are over. Some of the trees and shrubs noticed are not yet grown in western nurseriers. It is quite a select list, others can be added.

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Give my respects to the earnest workers of the Southwestern Iowa Horticultural society. Very respectfully,

J. L. BUDD.

Ames, Iowa, December 18, 1900.

GEORGE H. VAN HOUTEN: There is a lack of confidence in Mr. Terry. I think he could write us, if he would not be so very modest, and I must say he has been the most valuable writer for this society and its reports. I would recommend any who could to give him a call; there is much to see on his place, and give him a word of encouragement.

NUT CULTURE; GENERAL TALK.

GEORGE H. VAN HOUTEN: Hickory does not grow if transplanted in open prairies, but we can succeed with black walnuts and butter nuts. Do not recommend them in timber culture, but their planting for fruit.

J. H. M. EDWARDS: Thought our friend was going to give the black walnut a "black eye;" cut the tap root at one year and it easily transplants after that.

W. M. BOMBERGER: Coming from a chestnut country, we take some interest in chestnuts. We find that in groves of butternuts, after trees get to be thirteen to fifteen years old, the borers infest and kill the trees. If one year seedling nut trees are taken and transplanted in March, they grow well and vigorously at once. Never plant nut trees late. Prepare the ground and holes in the fall.

REV. MR. NIXON: Sweet chestnut grows well here and at Clarinda, but lack fruit; burrs not filled.

J. B. LAUGHLIN: Trees need to be in groups, or they will lack pollination. Have under test Japan chestnut and Japan walnuts. Lost none, and they went through the severe winter lately. Japan chestnut went through and we cut wood from the following spring, and grafted that and it grew. Lost a few, but most grew well. Grafted the black walnut and they grew well. I am desirous of getting them to fruit, as they are so much better than the common sort.

J. H. M. EDWARDS: I got two Japan walnuts from same party, as last speaker, but in my location they froze down every winter, resprouting each season.

GEO. H. VAN HOUTEN: To Japan anything is very indefinite; that is a great country and has as much difference in climate, soil

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and latitude as this continent has, beginning at Alaska and going south to Mexico.

J. B. LAUGHLIN: Sieboldii is the sort I have tested.

MEMBER: Can peaches be grafted on black walnut?

GEO. H. VAN HOUTEN: No; too violent to cross. Very violent graft crosses are possible, but impracticable, purely for the realm of experiments and the curiosity seeker.

W. M. BOMBERGER: Have any members had experience in grafting or topworking peach on Japanese plums? There is a similarity, and we have experiments under way, but not yet successful.

GEO. H. VAN HOUTEN: Theo. Williams, Benson, Nebraska, have made such.

J. H. M. EDWARDS: I am looking for a better plum than American plums. The Japans are not hardy with me. Has anyone fruited the Kansas Sand plums?

E. V. WRIGHT: Yes, we have at Hamburg. It is grown in Nebraska, high in color.

MR. JAMES MCGINNIS: We have plenty at Griswold; does well while young, and we think amounts to nothing, as it is not good as northern natives. Forty years ago I lived as a neighbor to Suel Foster, Muscatine, Iowa. He experimented and made chestnuts a "hobby," and it was always a loss, and I am satisfied that chestnut growing is not a success and should not be tried.

GEO. H. VAN HOUTEN: This, as many other things, is not talked of here as, or should be, considered as a commercial business; few make growing of vegetables pay; no one plants and grows popcorn to make money out of it. We want a few chestnuts as an additional home luxury, so should plant them, if money comes out of them, well and good; it is the luxury we want. We want to grow a home supply of chestnuts, nuts of any kind, butternuts, walnuts, hazelnuts.

SILAS WILSON: At Atlantic, many trees went out, but some are left which yield fruit that brings good prices. Iowa nuts and seeds should, as far as possible, be planted. The same is true with hardy maples, western hard maples will do well, and the eastern form nothing at all.

W M. BOMBERGER: Have traced the origin of some western plantings and find that where the nuts come from northern localities, northern Ohio, West Virginia, Pennsylvania, New York or the northern section of the chestnut timber belt, they are hardy

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in Iowa, but where they come from southern sections, southern Ohio, they are tender and sun scald and go out easily.

CANNING FRUIT, GENERAL DISCUSSION.

SILAS WILSON: My wife is better posted on this subject than I am, she says have clean, dry jars, steam fruit in jar, seal quickly and wrap in paper at once. Tomatoes should not be canned when over ripe, always in glass.

GEO. H. VAN HOUTEN: Canning in glass jars and at home, and such personal work is an opening for considerable business if undertaken anywhere. Factory canning cannot compete in that kind of work and fruit in that shape will command what it is worth. It will not pay to can vegetables as factories can do that best.

J. H. M. EDWARDS: We tighten lid down after fruit cools. Iron top expands as a barb wire fence, in changing temperature. Put up fruit or pure juices so as to give the pure article, healthful, invigorating, life giving. We must adopt some such feature to make use of our surplus fruit when it comes.

RUTH DICKINSON: Turning upside down is not necessary. Air pressure takes place as fruit cools and fastens down lid. Place wax paper on fruit inside of jar and all mould will come off with paper on opening jar.

MRS. O. B. STEVENS: Would not turn upside down only to let the liquid touch the rubber and make it paste fast. Put fruit in quickly and seal.

W. M. BOMBERGER: Glad to have friend Edwards associate the Mason jar with modern barb wire fence, it is a barberous thing and is too hard for any woman to seal and open.

MR. MCGINNIS: There is a new jar in the market from Monmouth, Ill, that is excellent and easy to handle.

GEO. H. VAN HOUTEN: It is good but danger of wire leverage getting too slack, but possibly it can easily be replaced.

MRS. O. B. STEVENS: I use large size enterprise fruit press to press juice out of grapes and small fruits, fill jar rather slowly at first, then quickly, and seal quickly. Have tried new jars and had some little trouble with covers.

E. V. WRIGHT: We find in canning the peach it is possible to submerge fruit in hot water as tomatoes, and peel them as easily and there is no waste. We have rigged up for canning on a large scale, and people come long distances, even from northern Pot-

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tawattamie county in rigs and come right to my peach orchard and can peaches and haul home the canned product.

S. E. FIELD: There is no work that has made more progress than the saving and caring for canned fruit. Years ago, we knew nothing of this work. Retailing canned goods will always be profitable and the demand will continue to increase. Wholesale work can never be made to touch work of this kind.

GEO. H. VAN HOUTEN: We generally used a private cannery to make use of the surplus fruit when we were stuck on getting off large pickings of fruit on Saturday that would not hold over until Monday.

On motion, Mr. A. B. Marshall, W. H. Marshall, Arlington, Neb., and A. J. Brown, Geneva, Nebraska, were made honorary members for one year.

ORNAMENTAL PLANTING AROUND PUBLIC BUILDINGS AND ON PUBLIC GROUNDS, GENERAL DISCUSSION.

J. H. M. EDWARDS: I think this is nursery question and not profitable to talk on here.

MR. MCGINNIS: I think not.

J. B. LAUGHLIN: Nurserymen are often made to "pony up" and give a good deal to help such grounds.

GEO. H. VAN HOUTEN: This is a live question, think nurseries, public officers, tax payers, children, women, all are interested and can here work in harmony for public educational good. In the city of Des Moines, we have a city improvement association which look after all public grounds and buildings, and they have even invaded the police station grounds and are planting them with flowers. Colleges in this state have done a great work and will continue to do so, at the State University and at Ames, the grounds are magnificent as well as at Cornell and all other colleges.

J. H. M. EDWARDS: If this is what he meant, I endorse every word. "God pity the home that has only a hog in the front yard."

WESLEY GREENE: Generally speaking, this work has been neglected, and more interest should be taken in it; more money expended in decorative planting around county buildings, school houses, etc.; more ground should be laid out around farm homes for ornamental planting and more attention paid to lawn making.

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HOW TO GET THE PUBLIC INTERESTED IN GROWING SMALL FRUITS AND GRAPES.

General discussion.

W. M. BOMBERGER: By delivering fine, fresh fruits at their doors.

G. F. FRITCH: Advertised as follows: "Get strawberry plants that grow berries large as eggs of G. F. Fritch." This seems to get them interested.

HENRY FIELD: The bare fact that large yields and the profitable growing of fruit is possible, it will interest the public if they find it out. I have picked and marketed strawberries here that yielded at the rate of 1600 quarts an acre, and blackberries at the rate of 5,000 quarts an acre. As soon as you grow fine grapes and get only two and three cents a pound, the public get interested in them. In fact, three-fourths of the farmers and home makers are asleep as to the real facts as to what their homes would give them in the way of flowers, small fruits and tree fruits.

J. B. LAUGHLIN: We ought to give out notes of anything we especially succeed with, in our talks. Madam Elliott rose is a constant bloomer from spring until fall on my place and has been for many years an old standard sort and grows easily from layers.

HOW TO INTEREST THE PUBLIC IN ORCHARDS AND TREE FRUITS.

G. F. FRITCH: In eastern Mills county, general farming interests the public. You would nearly scare a man to death if you would suggest to him to plant $10.00 worth of roses or tree fruits. You can get a good deal of talk out of them on corn, cattle and hogs, and it is easier to interest them in those things than in horticultural work or tree planting.

L. O. WILLIAMS: Give them object lessons with good, well kept orchards. A successful plantation is one of the best educators. After they see and know results you can interest them.

REPORT ON FRUIT DISPLAY.

MR. PRESIDENT: I hereby submit my report as committee on display of fruits and recommend the following premiums to be paid as offered in the premium list of your society:

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County Displays:
Polk county, 83 plates, 1st premium.....$10.00
Mills county, 23 plates, 2d premium..... 7.00
Individual Displays:
B. Stuart, Ivy, 40 plates, 1st premium..... 7.00
J, P. Jackson, Glenwood, 23 plates, 2d premium..... 5.00
Plate Display:
B. Stuart, Ivy, 16 plates, first @ 30c..... 4.80
B. Stuart, Ivy, 1 plate, second..... .20
J. P. Jackson, 1 plate, first..... .30
J. P. Jackson, 4 plates, second, @ 20c..... .80
Plate of 5 Seedlings:
B. Stuart, Freels seedling, 1st premium..... 3.00
B. Stuart, Underwood No. 1, 2d premium..... 2.00
Canned Fruit:
Mrs. O. B. Stevens, Shenandoah, 24 jars, 1st premium..... 5.00
Henry Fields, Shenandoah, 19 jars, 2d premium..... 3.00
Display of Vegetables:
O. B. Stevens, 1st premium..... 3.00

Henry Fields shows a fine lot of the Livingstone and Michigan potatoes for which no premium is offered, and A. J. Graham of Adel, shows a collection of fine varieties of pears that deserve mention.

Respectfully,

L. O. WILLIAMS.

REPORT OF COMMITTEE ON PRESIDENT'S AND SECRETARY'S REPORT.

We, your committee on Secretary's report and President's address, would report on same as follows:

Of the many good suggestions made in these papers, we can heartily endorse, and would concur in, the following: As regards the committee to be appointed to devise or recommend some means or manner in which a greater interest could be worked up, and increased membership obtained, and also in what manner we could get before the people the different subjects that are generally discussed at these meetings and at other times and seasons of the year, that they might increase the interest in horticultural work, would also recommend the careful reading of said addresses and report by all interested in horticultural work.

IRA M. NEEDELS,
O. H. BARNHILL,
W. GREENE,
Committee.

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REPORT OF COMMITTEE ON TREASURER'S REPORT.

To the Southwestern Iowa Horticultural Society: Your committee examined the Treasurer's book and vouchers and compared same with report and find same correct.

Total amount reported including cash on hand at last report	$429.73
Paid out during year	220.11
Cash balance on hand	$209.62

Your committee counted cash which was in form of money and bank draft, and find the amount correct as reported; we, therefore, recommend that the report be approved.

G. H. VAN HOUTEN,
JAMES MCGINNES,
HENRY FIELD,
Committee.

IRRIGATION.

L. O. WILLIAMS: Have had two years' experience at Kearney, Neb. Went to that state because of advantages of irrigation, on the supposition that the use of water in a very dry country would pay. Am located now at Kearney, on the Platte which runs by our plantations; use water from a canal on a cherry orchard of 5,000 trees.

Don't depend on it for all fruit planted. Water cherry trees twice a year, near July 1st, and later at freezing up, or just prior to that. The peach, with us, does the best on clay hills. For our fruit we use the zone system of planting, that is, around the hills so as to catch the water and retain it along the rows in trenches. Cultivation is so arranged as to leave trenches around the hills to catch all water possible.

GEO. H. VAN HOUTEN: Have known Platte river for many years, over thirty, fear it will go dry because of denuding the hills of timber that feed it with snows. The time will come when irrigation will only be safe by storage between freshets. Think that irrigation will take immense sums of money, and that will be hard to raise, it will be hard to get the public to pay taxes from one section to help others to compete with them.

OLD AND NEW FACTS IN GRAPE GROWING; GENERAL DISCUSSION.

J. H. M. EDWARDS: Have done a good deal in this line, but find there is much to be learned yet. Pruning is the vital point, renewal pruning is the best. Cut out and keep back old wood, and have new wood as much as possible. The idea that Concord

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is good enough is not enterprising, as we can do better with Brighton, Eldorado, Agawan, when covered in winter. Early Victor is very fine in flavor. Nothing can equal Brighton. Prune properly, cultivate, and you can grow the best. Am not satisfied with the question of fertilization. I use barnyard compost. When the weather is wet we have trouble with rot. Would add Worden to the list. Think Concord is nearly as good as Worden, last is tender and perishable in fruit, but of high flavor. For the general planter to leave exposed through winter Concord is best.

A. P. ELLIOTT: Can only give little of my experience, Moore's, Early is a good grape; it pays well and stood through the test winter without injury. Have planted pretty deep. This season had a good crop from Concord, Worden Moore's Early, Pocklington, Agawam and Brighton. Lay down everything but Concord and Moore's Early. Have on trial newer sorts recently introduced.

LABOR IN HORTICULTURAL OPERATIONS.

A. J. BROWN: Prefer intelligent, mature labor over any kind of child labor. We have found it pays to do work well, and to pay full value for the best, either for fruit growing or in the nursery. Russian Germans are near us, and we find them good people to employ. Next we like the Swedish labor, we employ it, but the German stick to it better. They do just as we want them to, they obey, and that is much to have help do just what you want them to do. We have for years bought forest tree seeds from boys, some deliver them all right, some deliver them with sand in them, some sell them to us all right and then swipe them and sell them back to us. I insist on the iron clad rule that labor must do just as I order and want it done.

HENRY FIELD: I want men to do as ordered, but give them some latitude and discretion to use good judgment, as it is impossible to give all orders in detail. We use boys also, 12 to 18 years old; are all right if properly trained.

J. H. M. EDWARDS: Boss' orders must be obeyed, but you must give a little confidence and latitude, you cannot use men like a machine, but I want to say right here, "give the boy a chance;" train him right; make a man out of him.

J. B. LAUGHLIN: Be careful of the instructions you give to your help, insist on obedience but give proper instructions.

S. E. FIELD: As to usefulness of boys, we have many illustrations here in Shenandoah, many of our successful business men were employed in the nurseries here, and have been good help,

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and owe their usefulness to early training. These nurseries took them as boys and made men of them. Boy help is good if a competent overseer is over them, but he must command, and there must be implicit obedience.

G. F. FRITCH: Believe in boys being obedient; the trouble is, that they know too much; they know all that the father knows, all the mother knows, and taking that together with what they know, they outwit parents and the boss.

MEETING NEWER CONDITIONS.

BY G. H. VAN HOUTEN, LENOX.

To one who has seen a country develop, from a wilderness condition, to our present day civilization the thought is forced on him, that if it could have been known the changes that were to take place and the conditions of the present, he could have been in command of the situation. Opportunities have been such that the far-seeing person could acquire a great amount of real estate, for example, which is but another name or term for saying that had he known the conditions that would have come he could have easily been rich. This suggestion is but offered for the purposes of illustration, for the same principle would be good in other affairs of life the same as it would have been in the acquisition of Iowa lands. In fact some men are far-seeing enough that they can take advanthge of coming conditions and be ready for them. It is asserted by some that it is luck or mere chance, but that some men are univarsally successful and others are generally unsuccessful is more than mere chance. A man is, generally speaking, the architect of his own fortune and that many well informed men do not acquire wealth is not an indication of lack of application, for it may be true that they have had other objects in life, or that they have been so free and easy as to lose in the general push and rush of the business world. But this is not the line of reasoning that was expected, perhaps, but that the *way* to meet present or future conditions being the important matter for consideration. Some assert that experience is the only true guide, but experience may not be a true guide, for there can be no such conditions in the future as there have been in the past; so past experiences are of little value, except as they guide the reason or judgment to determine what changes will take place in the future. That there is constant change, none, it is presumed, will dispute, and that there will be changes in the future none can deny, but what are the changes that are to take place? Of course none can with certainty say, but that there will be great changes and that in the near future is to be expected.

A few years ago it was believed that there would be a tendency to rise in price of lands used for agricultural purposes and that this would have a tendency to division, and that more and smaller farms and holdings would result. The wish may have been father to the thought, for it was and is, generally conceded, that many small farms are more to the advantage of a country than fewer and larger farms. But the cold facts are that the tend

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ency is for consolidation. The immense growth of our cities and the decrease in rural population is one of the wonders of modern civilization in the United States; but we should remember that conditions are changing and it is possible that we will come to the conditions of the older settled portions of the globe, where there is absolutely no rural population. This is generally believed to be an undesirable condition and yet, if it is to come would we better not know it? Of course, we will not live to see the day that there will be no rural population, but we may live to see the day that corporations will take a hand in agriculture as they have in all other productive industries. There are obtainable facts now to show that there is a tendency in this direction. It is estimated that in the wheat rasing countries that large farms can raise wheat cheaper than can small farmers competing; and investigation seems to prove that the lowness of cost is almost in portion to the size of the farm. For example it is estimated that on a small farm it costs nearly a dollar a bushel to raise and send wheat to the nearest market to the farm where grown, but that a farm of one hundred or more acres can raise wheat several cents cheaper than can the man on twenty acres of land. This calculation has been carried so far that it is estimated that on the very largest farms wheat can be grown at a profit at less than half the price of the first farms named. It seems that master minds direct, combinations of capital enable advantages to be taken and cost to be reduced, so that the small farmer cannot compete with the larger farmer or corporation. We have seen this in the mercantile operations of the country and the department stores are but illustrative of the thought desired to be advanced. We may theorize all we please about the small merchant being driven out of business being a bad thing, yet the fact remains that he is being driven out and it is useless for us to expect that he can compete with his neighbor who buys cheaper, because he buys in larger quanitities, has the cash to pay, can get advantages in shipping in car-load lots, economizes in draying charges, for he can employ his own teams or hire full loaded drays, while his competitor must pay more in proportion for his smaller lots.

We see foreigners coming to our shores by the hundreds of thousands each year. Most of these people are poor, some of them very poor and yet in a short time many of them own the farms left by the fathers for the children. They are not more intelligent than our native born people, and many of them are not more industrious. They are more economical, for they have been brought under circumstances that induce the most rigid economy, and economy is one of the things that it is difficult to teach to the American youth, surrounded by far too good circumstances. This country is reaching a stage in its development when it begins to look like that those who were owners or inheritors of the soil are to become homeless, at least landless, for, when the farm is gone they can move to town and many of them become renters.

I have no sympathy with the modern injunction "boys stay on the farm," for I believe that the boy, as every other person, should do that which is best for him and many a country boy will, in the years to come, be business men in the towns and cities; they will be professional men and and some will sit on the supreme benches of the land, but if they always remain on the farm they are much less likely to reach eminence in the professions or in business. But you may say "successes in business or in the

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professions are not more conducive to wealth and happiness than country life." Possibly this is so, but suppose it is? Suppose that the boy longs to become a business man; has rare adaptability for such a career? Would you hitch the race horse to the plow? Would you harness the saddler to the dray? Would you, if in a great hurry to go a distance, drive a valuable draft horse? Hardly. Then do not set up a standard and expect every one to conform to it, for there are many things to consider. In the first place, there is not room on the farm for all the boys. The tendency is for centralization of population, for the aggregation of capital, for a consolidation of interests. This may not be the best thing for the country, but it is the inevetable and he who resists a tendency must do so at his peril The more that leave the farm and the fewer that remain the better the chance for those for those who remain. Do not consider what is said as evidence, as to the natural gravitation for centers of population, but consider it all the same, in calculating as to the future of the country. Had some one said fifty years ago that Chicago would contain more than one-third the population of the great state of Illinois, with its great stretches of fertile soil, its great and well scattered coal mines and the wonderful possibilities in the way of manufactures, he would not have been believed, but he who predicts that more than one half of the entire population of Illinois will, in the near future live in Chicago is likely to live to see the prediction verified and that in the near future. What is said of this one state and one city but shows a tendency that is quite general, if not so marked, all over the United States.

The above was said as an introduction for some conclusions that were to be offered, but the length of this paper admonishes me to let you form the conclusions.

L. O. WILLIAMS; Large farming operations are not said to be a success as stated by prominent writers in magazine articles, and we have it from some we have met who were interested in them. Men growing wheat on a large scale, now claim that all that had ever accrued to them was the increased value of the land.

SILAS WILSON: I agree in most, but not to all that has been said. I wish to emphasize the thought of the great concentration of populations that is now taking place. It bodes well for fruit grower and producer as it will insure an immense and stable market at home that can be depended upon. We believe that this and the rapid increase of population will avert the calamity of any more eight to twelve cent corn again under any ordinary conditions.

GEO H. VAN HOUTEN: Want to be understood properly: wealth and corporations are now gathering areas of land and rural population is withdrawing. It is noticeable here in counties of Iowa. Already the country schools are rapidly reorganizing and gathering into the township high schools. In the old country, rural districts are all organized in communities and not

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isolated farm houses. We are but going into the same thing that has been the history of century-old governments in the old world. It will not be just on the same lines and will be with improved methods. And to the advantage of all rural population we hope.

UP-TO DATE FACTS ABOUT CHERRIES—DISCUSSION,

SILAS WILSON: Nothing that I know of to offer that is new on this subject. Would like to hear what is said to point and of value. Any good, dry corn land will produce cherries, but if you want anything of value in this world, it requires effort. Commercial cherry growing is safe, as there are large markets north that can never be filled with home grown fruit. Only a few varieties need be planted and they do well. Early Richmond, Montmorency and Morello. The latter is best for commercial purposes, they hang on longer, can be handled better, don't have to rush them off so quickly. Other varieties are fruitful at some places, but the three named are the best. The Baldwin cherry we have examined carefully in fruit and think it is the old "Northwest" of D. B. Weir, formerly of Illinois. Sweet cherries are of no value, will not fruit in this country and useless to plant them. Would advise to plant a few cherry trees yearly on the home lot.

A. J. BROWN: Would you advise planting on Mazzard roots?

SILAS WILSON: Yes, but plant deeply. The dark juiced sorts do best on that root and make the best trees. Capt. Geo. S. Bacon says that the Ostheim is a full and heavy bearer if grown on own roots. Claims that it is the highest flavored of all cherries. Some sorts of cherries are no good at all on own roots. Late Richmond is not. Plant all cherry trees deep.

A. J. BROWN: By force of circumstances we had to use many Mazzard cherry stocks and wanted to know. Our success is not complete working Mazzard. We are trying in Nebraska, to get the nomenclature straightened out. We have a standing committee in our Nebraska society that I am associated with and hoped to get all the information possible; want all items we can get from any of you gentlemen. We made arrangements to forward samples and sent many to Ames, to Prof. Craig, but received no acknowledgments or information on any shipments of fruit sent there, with the exception of one time. From our investigation Dyehouse is the same as Early Richmond. We can find no difference between English Morello and Wragg.

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GEO. H. VAN HOUTEN: That is easily accounted for since these cherries have been sold and used as stock and buds interchanged so long in nurseries that they are mixed now.

A. J. BROWN: We found no difference, only after test winter, fruit buds on Wragg were in best condition, but this may have been from other causes; individual difference in trees may have been the cause. Ostheim, Ostheimer, Cerese-de-Ostheim fruit we found no difference, it was all alike, as far as we could see. We have nothing of value in Russian cherries on our soil, and see nothing of value in the Terry; as we have seen the fruit it is no better than others in cultivation. The worst mixed up mess is the Montmorency. Think the Ordinaire the best one, not so strong a grower as the Early Richmond but has better foliage; fruit lighter red, larger and sweeter.

G. F. FRITCH: This is old ground we are doing over; we were to take up new facts.

J. P. LAUGHLIN: I planted Black Morello sprouts and grafted on them. Mazzard stocks are hard to work and make grow; Mahaleb dwarfs too much, makes trees too small, no bearing surface. Early Richmond on own roots, I find good if tops are pruned and kept well open.

J. H. M. EDWARDS: Morellos on Mahalebs, if planted deeply are good. Picked 110 quarts from a tree on this combination, tree seventeen years old. I am satisfied that with such results as Mr. Wilson gives, they hang on well and are profitable.

A. B. MARSHALL: The cherry will stand more varieties of soil and management than most any other kind of fruit. It will grow right up to the very sand hills of Nebraska, and so far north that only extreme cold will kill it. It will fruit under the most adverse circumstances and yield a profit. Sixteen to twenty feet is a good distance to plant. With low heads this will admit of gathering the fruit easily from the ground and lessens expense of picking. Our Montmorency bears young. We have two sorts, one is mottled, is lighter red, mottled some in fruit. Customers that know Montmorency, take it first if they can get it. Morello is good to ship, but Montmorency brings the best price. Bears annually. Do not prune out tops, it is injurious to the cherry. Early Morello and Terry are entirely different.

GEO. H. VAN HOUTEN: Think that no limb should be cut out of cherry trees. In my county, on dark retentive soil, Russian cherries thrive, some do better than old standards. They fruit remarkably well. The confusion of nomenclature in Iowa is as

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bad as in Nebraska. Glad to know that an effort is being made to get the confusion straightened out.

SILAS WILSON: Parry told me that he imported the Montmorency, and found two kinds, and that the Montmorency with best fruit and bearing habit was the Large Montmorency.

More discussion as to the Montmorency continued but led to a confused discussion without definite results. (Secretary.)

ADAPTION OF SOILS TO VARIOUS FRUITS.

BY W. T. WORTH, MAGNOLIA.

There are many kinds of soils in the state of Iowa, although a person traveling across the state from east to west or vice versa, might think the whole state consists of one vast stretch of prairie, without any variation in the surface soil or the subsoil; if so he would be badly mistaken. Those of you who have read Capt. R. P. Speer's experience with fruit trees on his farm in Black Hawk county will recollect that he describes several kinds of subsoil on his place and that he says certain patches are good for some varieties of apple trees while other patches only a few rods away are totally unfit to grow the same kinds of trees, and cause them to fruit successfully. I shall not attempt to discuss the geological formation of soils, even if I could; that has been done by our professors very ably and their reports will be found in back numbers of the horticultural volumes.

My own experience convinces me that the soils vary a good deal and some of them are very superior to others in our own state. I have often wondered when reading the state reports that so little was said about soils and locations. I have planted two orchards on the prairie and two on timber lands and I am well convinced that nearly all timber lands are far superior to the prairie soils. Most fruit growers will no doubt agree with me in this, but say there is so little timber land in the state that this statement is hardly worth considering. Of course there is not much valuable timber, but there is a good deal of brush and scrub timber throughout the state. I recall several orchards planted on prairie soils near the house, sometimes in a slough, with a knoll of hazel brush and shrubs only a little way off. Now timber soils vary as much as prairie soils, probably. Hardwood soils are much better than softwood soils, such as basswood, white elm, etc., especially on this western slope. I cannot avoid the conclusion that the growing of the various kinds of trees and shrubs, annual and perennial wild plants, such as pea vines, grape vines, raspberries, blackberries, red and black haws, the native crab and plum, the red and black cherries, etc., have deposited in the soil certain elements from the air, as nitrogen, potash, phosphorus and others, while on grass lands there is not such a variety of elements deposited. Some of them are there in excess, while other essential ones are almost wholly lacking, how could it be otherwise, when no two plants deposit the same elements in the same proportion. Then again on these lands the plants and leaves lie on the ground, in the shade mostly,

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decaying and forming an abundance of humus, while on prairie lands the fires have burned the dry grasses in autumn and the winds have carried the minerals or ashes into the lower levels.

I think strawberries will do as well on prairie soil, but blackberries will not, neither will apples. This is my experience. Pears also do better I think. I have not had so much experience with them but have observed their behavior on different sites and locations. Plums thrive on the very richest and blackest prairie lands, but cherries do not; on the drift soils they should be planted on the highest and dryest grounds. Gooseberries and currants should be planted on northern or eastern slopes and near the base of the hills where the ground is coolest, richest and dampest. A dead level or flat section of country is nearly worthless for growing fruit. The more undulating or hilly the better and the north and east slopes are better than the south or even west slopes, though grapes do well on south slopes, if cultivated well. Now as most Iowa people live on prairie lands I don't wish to discourage them from growing enough fruit for their own use at least. It can be done, for some varieties do well on almost any soil or location, as the Duchess of Oldenburg, Wealthy, Patten's Greening, etc.

An open or porous subsoil is better than a very tenacious one which lets the water down readily and lets it come up near the surface in very dry times from the lower depths, and last but not least, fruit trees get ready to bear in about one-half the time on good timber soils. Why even the Walbridge is a profuse bearer here on such soils when ten to twelve years of age; the trees ripen sooner and more perfectly, as all the elements needed are within easy reach of the surface roots. Moreover, the trees grow more stocky, shoot up higher, have fewer small branches and consequently less leaves while they look low and bushy on the prairies.

On this western slope I think some patches of the subsoil are too porous, too dry and ashy; the timber soils are generally better in this respect, the clays being a little redder, heavier and moister. They are ideal soils I think. The people of southern Wisconsin say they have a banana section in their state 150 miles north in the timbered hills near Baraboo. They succeed there with varieties that utterly fail near the Illinois line. Let someone rise and explain why this is thus, if he thinks level prairie lands are equal to hill lands, especially wooded hills. Now in conclusion, before setting out an orchard, I would recommend that a person dig down four or five feet with a spade on different parts of the farm and plant the orchard where the most suitable clay is found. If in eastern and southern Iowa the most porous clay will doubtless be best, while in western and southwestern Iowa he should select the opposite or most tenacious clay; it will be loose enough. I think I would make the orchard there no matter where the house is. You may plant something else more profitable near the house.

Discussion in three to five word replies.

What is greatest disadvantage in southwestern Iowa to fruit growing?

L. O. WILLIAMS: Lack of water.

J. H. M. EDWARDS: Lack of energy, stirring soil.

W. M. BOMBERGER: Produces corn, hogs too easily.

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D. B. McCALLA: Lack of cultivation.

G. F. FRITCH: Lack of climatic conditions.

J. R. BLACK: When and what age is best to seed down orchards?

J. H. M. EDWARDS: After five years of start with thorough cultivation.

SILAS WILSON: Cut the clover and leave it on the ground as a mulch. I use pumpkins in orchard before seeding and find them good. Had orchardists from New York visiting me and while walking through my place, said they could feel that the ground was filled with humus by tread of foot on ground.

W. M. BOMBERGER: Mr. Wilson, do you not think the reason our earlier orchards lived so long and did so well in remnants was because they were started on soil filled with humus and virgin fertility?

SILAS WILSON: I think it is.

J. B. LAUGHLIN: President Murray of the Missouri society leaves clover on to rot. I was on their place and saw a large tract of orchard that was treated to commercial fertilizer and the result was remarkable. Figures were given showing that it paid.

How is commercial fruit growing best made a success?

G. F. FRITCH: I did not prepare a paper, but would briefly state that it is best accomplished by practicing what we preach here at these meetings.

Election of officers resulted as follows:

J. P. Jackson, president.
J. H. M. Edwards, vice-president.
W. M. Bomberger, secretary.
O. H. Barnhill, treasurer.
Director First District, Henry Field, Shenandoah.
Director Second District, Geo. H. Van Houten, Lenox.
Director Fourth District, C. H. Deuer, Missouri Valley.
Director Fifth District, James McGinnis, Griswold.
Director Sixth District, B. Stuart, Rural Route No. 1, Altoona.

Red Oak was selected as the next place for annual meeting.

OPEN DISCUSSION: "WILL GRAPE GROWING PAY NOW?"

GEO. H. VAN HOUTEN: We have in the past, in this society, spoken of grapes commercially, by the acre, field culture and of fancy varieties; we ought to give grape growing attention on home lots and grounds. Concord is good enough and to many, very good. Other varieties may have advantages, but the Concord is known and it needs replanting in many places where it

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will grow and its management is well known. Every land owner should take some interest in the grape. They should be on every lot. It should be the popular fruit. While Moore's Early and Worden are good for many familiar with them, we know the Concord; it has a hold on the masses; urge them to plant it. It pays to cultivate and cover grapes, but amateurs and commercial operators are more apt to do this than the home grower who plants what he does not have to fuss much with.

A. B. MARSHALL: It must be understood that the Worden needs close pruning and it then gives excellent results; Moore's Early, long pruning, and it needs a richer soil. They ripen a week earlier than Concord, sometimes more than that. Both bring a better price than Concord. Moore's Early ripens about the 13th of August.

W. M. BOMBERGER: On hill lands where there is little humus there is so little difference in the Concord and Worden, it is a surprise, but back on richer corn soil where the Concord is too rampant, the Worden develops better, larger, sweeter fruit and is highest in quality of that class. Moore's Early does better on stronger soil, and we have grown our best fruit in the bottom of a ravine.

HENRY FIELD: Grapes have paid for many years. Pocklington is good with me, very fine for eating and canning. It is more hardy with me than Concord.

J. H. M. EDWARDS: Moore's Early never paid with me, and Worden is tender, and the early picked Concords spoiled their sale.

W. M. BOMBERGER: Not so with me when rightly grown. Moore's Early and Concords drove out the sale of green Concord, and ripe ones for that matter, where I sell.

FACTS LEARNED THIS SEASON—GENERAL TALK.

HENRY FIELD: I have learned that it takes more than one season for grape vines to die.

C. H. DEUER: I learned that it took the 2,500 Concords I planted two years ago less than one year to die.

CAPT. CASTLE: A word as to irrigation: I was not in when it was up. The successful grower is the one who can get the most water in his fruit. In this, the fruit business is different from the dairy. Have been making a few experiments with wind power, and the distribution of water by force of gravity. I have been at this work for two years and claim not only experience,

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but of handling it on the plan that "in new things always touch lightly." I commenced an attempt to get a little more water into the strawberry. Set up a 120 barrel tank and turned it on the berries. I had no conception until then, of how much water it takes to irrigate. I made a mistake in calculating how much it would take. Another thing found out, is never to let the ground get dry. It is easily kept in condition by turning the water on in time, and great damage is done by letting the ground get into a mortar condition, (dried mortar) after wetting. Parker Earle did the best under irrigation, but must have very rich soil. Think my results will be excellent next spring.

L. O. WILLIAMS: There is such a thing as dallying with water; work must be thorough and cultivation follow.

J. B. LAUGHLIN: My son came from Arizona where he had experience with irrigation. I was about to put in a plant when he began laughing at me and asked me to figure out the amount and weight of an inch of water on an acre. He says it is just awful work and if taken on a large scale, required considerable money, and a few nights work in the mud and ditches will satisfy anyone here with the natural conditions and blessings of rain.

NEW SMALL FRUITS.

W. B. DAVIS: Loudon is the best red raspberry yet tested.

J. B. LAUGHLIN: In grapes, McPike, Brighton, Campbell's Early and Worden have high places.

J. H. M. EDWARDS: Eldorado is high in quality.

F. V. WRIGHT: Mr. Hale has a grape from a party in Council Bluffs that came from Italy. It is doing well, looks like Flame Tokay.

GEO. H. VAN HOUTEN: New things with extraordinary behavior, for a few seasons should be taken only as they behave for the time. They soon drop out of sight.

W. M. BOMBERGER: York Imperial proves tender in tree and blights on my soil.

A. J. BROWN: It blights badly with us.

REPORT OF THE COMMITTEE ON RESOLUTIONS.

Your committee would respectfully report the following resolutions for adoption:

***Resolved*, That the thanks of this society are extended to the officers of the Christian church for the use of their building for this convention.**

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Resolved. That we tender the thanks of this society to the ladies and gentlemen who entertained us with vocal and instrumental music, and to O. B. Stevens for the flowers and decoration which have added so much to the enjoyment of the meeting.

Resolved That we express our gratitude to the citizens of Shenandoah for many courtesies received; to the press for services rendered; to our officers for the efficient manner in which they have discharged the many duties imposed upon them; to the local committee for their untiring efforts to make the meeting a success.

W. GREENE,
SILAS WILSON,
JAMES MCGINNIS,
Committee.

REPORT ON FORESTRY.

BY A. W. HATFIELD, CORRECTIONVILLE.

To Members of the Southwestern Horticultural Society:

In answer to your invitation to meet with you, I very much regret that I am unable to do so, and my excuse might be of interest to some of your farmer members like myself.

Some years ago, I and many others in this neighborhood planted quite a number of cottonwood trees on our bleak prairie farms, and we are now harvesting the crop in the form of lumber. One of my neighbors has finished cutting 75,000 feet of lumber from a single row of trees, one-half mile long. Is there not a good profit on the land those trees occupied? I have let the contract to cut 30,000 feet from a row 140 rods long, and the mill is setting up on my place at the present time and I am obliged to see to the cutting and marking of my logs to have lumber made that suits my purpose best. I wish to speak of this because our forestry planting has been looked upon as a losing game.

Since writing the above, I talked with the proprietor of the saw mill, and he informed me that he has contracts for cutting 600,000 feet of lumber in this neighborhood.

SPRAYING.

PROF. A. T. IRWIN: This is one of the newer problems. It was not so necessary years ago, but comes with newer and more recent conditions. In spraying, the results have been variable, in that you may hit a year in which there are no insects, or only a small number. In spraying, we work mainly for two purposes, viz., to destroy fungus and to destroy insects. Biting and sucking insects are the two classes which we must treat. Kerosene emulsion is used to destroy sucking insects by contact, the kerosene spreads when it touches a body and covers it with a film and shuts their tracheæ and closes them so they cannot breathe. At present,

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mechanical mixtures of water and kerosene are made by special sprayers to avoid the labor of making the emulsion of soap and kerosene, but the variable quality of commercial kerosene makes this hazardous and mechanical mixture is in experimental stages yet. Pumps are made so a gauge can be set, and any per centum of kerosene can be thrown as indicated by the gauge.

For general spraying there is now a compressed air pump made that can be charged and set agoing in the field, and will operate itself. For biting insects paris green is best. The London Purple is variable in strength. Spraying needs to be thorough under the leaves, and every part of the tree should be saturated. Care should be used to add slaked lime in proper proportion to avoid burning the leaves when using the Bordeaux mixture.

J. H. M. EDWARDS: We sprayed and learned considerable about it and got some good out of work last year. I placed a large tank on wagon and we sprayed ten acres of apple trees. Burnt some foliage, but got in enough lime next time. Had less worms and trees were much freer from scab, but had an unfortunate experience in this—that we put clean apples in the cellar and the very scab was on the cellar walls and propagated while the apples were stored; it got on my apples badly and did much damage. I believe we need a law to compel neighbors to spray and not keep a nuisance on their premises over the fence. We need a law badly. Cleaning up premises is a good thing, especially all rotten apples and decayed plums, and it pays to keep a few hogs in the orchards.

G. F. FRITCH: Think it is a good plan to spray, but compulsory spraying is not possible. We cannot compel people to quit growing cockleburs or stop drinking whisky by law.

PROF. A. T. IRWIN: In use of mechanical mixture of kerosene as strong as 20 per cent. has been used on the apple, but that is strong and dangerous unless it is carefully determined by test what they will stand at that time. Five to 7 per cent. is safe, generally; 7 to 10 per cent. is the danger line if used on green foliage of apple, plum or cherry.

J. P. JACKSON: Have had eight years of experience in spraying, did not always get good results that were visible, but that was not chargeable so much to spraying being an entire failure as to my inexperience and that the conditions were not right, or that the work was not rightly managed. Have had good results and have made up my mind that spraying is one of the essentials of good apple growing. Made various tests with paris green and

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arsenic. Last year it was a great advantage and we could see it on the trees. The very color of foliage and general healthfulness of trees showed it. Neighbors not being careful I do not think cuts much of a figure. As I have left check trees and sprayed right along and the trees left were badly affected and sprayed trees near them, about the same as the rest of sprayed orchard. But I think that trees in orchard should be cultivated and manured to keep them in health and vitality. Think we should spray later than June, as I found worms developing after that.

O. H. BARNHILL: This is an important subject and needs more space in the report, and would report a fine orchard that was carefully sprayed at Hamburg, but there were no visible results at all.

J. P. JACKSON: That is not conclusive at all; first, spraying only gives a part of the experience that is necessary to spray successfully. I have sprayed for years and find I have some things to learn yet. Should rain delay one spraying ten days, that alone may spoil much of the whole season's work. It is a good plan to have everything ready and have the material for the mixtures ready to combine the day before you want to spray. It is not much of a task if you know how and have the things handy and in readiness. In averaging the cost of spraying fifteen year old trees three times, cost me 13 cents for each tree. As to pumps, any good up-to-date ones will do, I have worn out several; use the Spraymoter now.

SHADE AND ORNAMENTAL TREES.

BY G. A. MARSHALL, ARLINGTON, NEB.

We too often rate the value of anything merely by the dollars and cents it brings in or represents. While we ought to consider that the dollars and cents so sought after and prized are of no value whatever unless it were for these comforts or pleasures that they purchase.

Seeing things in this light helps us to realize the *full value* there is in *pleasant surroundings*. Plenty of shade along with the sun shine, and plenty of windbreak in the winter for comfort of man and beast. Plenty of buds, blossoms and green leaves in the spring time, followed by beautiful trees, full of life and beauty, smiling on us at each and every opportunity, soothing us in time of trouble, and ever adding to our comforts and pleasures. This is certainly associated with the highest type of happiness and comfort. How *little* money could do in beautifying our village homes or our farms were it

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not for the excellent trees, shrubs, etc., that our Creator has placed within our reach.

Quite a number of varieties can be planted in our door yards or home grounds with good effect. Each variety should be planted where it will produce the desired effect when grown in its natural way. For example, if you wish a screen in front of some unsightly ground or obstacle, a row of trees that will naturally grow in a hedge without much pruning, say the Arbor Vitæ or Red Cedar, or the like will be desirable, while, if you wanted a large shade tree they would be very undesirable. You should then plant a large growing variety. Never plant a large tree in a small place, expecting to shear or trim it down to fit its surroundings, or a small growing tree where you wish a large one. If you wish a shade tree in the front yard, yet wish to preserve the view, a tall growing tree that naturally heads high is the thing. In selecting trees it should always be borne in mind that natural conditions should be adhered to as much as possible. Varieties that naturally grow in thick timber where there is considerable moisture and no wind, will seldom make a perfect specimen if planted in an exposed place. The most shapely and beautiful specimen is only obtained by studying the natural habits of a tree and then trimming it the way it wishes to grow. Nature should be helped in all cases instead of opposed. In street planting the varieties should not be mixed, as it breaks the uniformity, thus spoils the effect. Much better plant just one variety on a street, or on each block at least. A street tree necessarily has rougher usage than those grown on a lawn, therefore should be of the very hardi-st kind, also a tree that will naturally head high or bear trimming up, as they should have a smooth trunk with limbs seven or eight feet high at the least. For wind breaks, two or three rows of evergreens are more valuable than a whole grove of deciduious trees, as they furnish the protection in winter, when most needed. As to varieties for the street, large dooryards, and shade trees in general, the elm, ash, hackberry, maple, linden, the oaks, coffee bean, white birch, walnut, etc., are all desirable. For handsome yard trees the cut leaved weeping birch, Mt. Ash, etc., are good. In evergreens, where large trees are desired, the Austrian and Scotch pines, the white pines, and Norway spruce, and for the smaller growing varieties the white and blackhills spruce, and red cedar are among the leaders; however, some of the western evergreens are very beautiful and are fast coming in favor. A great many other varieties of both evergreen and decidious trees can be easily grown, and I hope some of them will be mentioned with the results by some of the members in attendance.

WHY SO MANY FAIL WITH EVERGREENS.

BY B. STUART, IVY.

I, like many others, have had some sad experience with evergreens, but have learned that when skilfully handled few trees are more hardy than our common evergreens.

Failure can most always be traced to carelessness, or lack of proper knowledge in planting and cultivating. By carelessness I do not mean carelessness of the planter alone, for in some cases our nurserymen or their employes

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are grossly at fault in sending out trees seriously injured or greatly damaged by exposure of the roots to the sun and dry atmosphere while digging and packing. The planter after receiving trees is apt to neglect unpacking and heeling in or planting, which should be done immediately without exposing roots, for when once dried out no amount of moisture will save them.

We often see trees planted in sod, with only a small hole dug in which the roots are crowded or bunched together with no further care. We cannot expect good results from this kind of planting. Some injure evergreens by pouring water about the roots when setting in such quantities that with the dirt it forms a mortar and when dry weather comes it bakes, becomes hard, encasing the roots and preventing them from obtaining the amount of moisture and nourishment required by them. Others are in too much of a hurry and procure large trees, and no matter what the planting and care may be, will do no good unless staked or tied as the motion of the trees in the wind will loosen them at the base and thus expose the roots to the air. I prefer trees from eighteen to twenty-four inches.

The best time for planting is when the buds are from one-half to two inches long. Have the soil in prime condition set them somewhat deeper than in nursery row. I like dipping the roots in water before setting, then work loose dirt in carefully and press enough to hold the tree solid. All the cultivating needed is to keep weeds down and surface stirred and pulverized enough to form a mulch. If the above requirements were complied with we would hear little or no complaint about the growing of evergreens.

A. P. MARSHALL: Common planters seem to think that there is a fine trick and it is a great accomplishment to get evergreens to grow; we do not find it to be so. There is nearly always a nice moist day and usually several moist days in the spring, and we take such time to transplant them and have no trouble at all and get as good a stand as with any other trees. When planted in front yards—a thing we do not advise—we request large holes to be dug.

J. B. LAUGHLIN: Do not use any water in transplanting, only give good soil conditions. Planters usually pour in water and make a mortar bed, but this mortar bed condition does not continue, but hardens and kills the tree. In planting, pack the soil firmly on the roots, and afterward give good culture.

PROF. A. T. IRWIN: I wish to second his remarks as to puddling roots. Puddling shuts off circulation and stops growth. Place the tree a little deeper than you wish it, and when fulling in, raise tree to where you want it and then you will have the roots in a more natural position; then firm solidly the soil about them.

L. O. WILLIAMS: Advise planting small trees in good soil. We find the red cedar of the Platte is excellent for dry sections.

J. B. LAUGHLIN: This year storms such as never before, have visited us, they toppled trees and about everything that could be

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oosened. Many fine, noble specimens of evergreens were uprooted and turned over. Through the disastrous storms this season the noble white pine stood it all. We have them twenty-two inches in diameter and seventy feet high.

S. E. FIELD: At my old home in New England, they have all the planting and care of street trees in the hands of township trustees, and they are very strict as to care and removal and management of them. Even sugar camps are now under public supervision.

J. N. COLBY: I think fruit trees are ornamental. A most beautiful tree is the Sudduth pear. They can be planted in yards with good effect.

J. B. LAUGHLIN: White pine is very flexible and when wet this is increased and will give and not break in high winds.

BERRY NOTES.

BY SAMUEL HOLMES, HAMBURG.

For an extended discussion on b'ackberries I suggest a reference to page 478, Volume 34 of the State Horticultural Reports, and I will only add now that at ripening time last year hot dry winds shriveled and dried blackberries badly while on the bush. To obviate that I caused the bushes to be watered with a spray pump several evenings; and the results were good beyond anticipation. For early market I would plant strawberries on a slope facing the south and for later picking on a slope facing the north. The ground should be plowed in the fall if practicable, if not as early in the spring as possible. At planting time plow again; harrow well and cross harrow likewise; provide a drag about eight feet long and two and a half feet wide and two inches thick, with the front plank beveled on the under front edge, and a wagon tongue attached. Having a good team hitched to it and a driver standing on the back part of the drag go over every foot of the ground. If the soil is then not thoroughly loosened and pulverized harrow again. With an old style corn marker make rows about three feet apart one or both ways as desired. Plants should be put in the furrows at once before the dirt gets dry. Press the soil closely about the roots, and a vigorous growth will soon take place. Cultivate sufficiently to keep soil loose and vines clean from weeds. With a rolling cutter attached to the plow or cultivator keep the long runners cut from at least two sides of the main stalk, and in due season the husbandman will be well rewarded for his trouble and expense.

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SOME ADVANTAGES OF HORTICULTURE.

BY O. H. BARNHILL, SHENANDOAH.

I will mention only two of the advantages of horticulture. First, the comparatively small amount of land required. Ordinary stock and grain farming paid well enough when the country was new and land cheap, but when land costs $50 to $75 per acre, as it does around Shenandoah, intensive farming must be practiced in order to yield a reasonable profit on the capital invested. No branch of agriculture is so well adapted to intensive farming as is horticulture. There is hardly a limit to the amount of work that can be profitably given to the growing of small fruits, especially strawberries. In growing these, and most all other kinds of fruit, as well as flowers and vegetables, the more work and less acres the more profit. This point is worthy of the careful consideration of renters who are unable to buy an ordinary sized farm; young men who think of going west because of the high price of land here at home; men with small farms and large families; the farmer who is burdened with a large mortgage which he sees no prospect of paying, and by many others. Let the latter sell enough land to pay the mortgage, plant a few acres to fruit, and his income will suffer no decrease. Let the man with the large family set his sons to work planting and caring for fruit trees and vines, and his daughters to picking berries, canning fruit and gardening, instead of allowing the latter to become "hired girls," and the former "hired hands." They will then have the care and guidance of their parents, and the home circle will remain unbroken. Let the renter invest his modest savings in a few acres, raise fruit and vegetables and have a home of his own.

The other advantage of horticulture to which I wish to call attention is its superiority when considered from a moral and ethical standpoint. This phase of the question is rarely considered in deciding what line of farming to follow, partly because the differences that exist in this respect are not recognized and appreciated. However, it is now generally conceded that a meat diet is one of the least wholesome and healthful, especially when it consists of fried pork and the like. On the other hand, fruit is known to be the most healthful and wholesome food enjoyed by man, and its hygienic and therapeutic effects are recognized by all. Which food would you rather produce? Moreover, fruits and flowers are the highest form of plant life. The latter are the most beautiful creations of nature and are symbolical of Divine beauty and perfection. Daily association with trees and flowers cannot but have a refining and ennobling influence upon the character, unknown to the man who spends a large part of his life in the pig pen, feeding swine and cattle. It is true, we ought to engage in work that is profitable in dol-

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lars and cents, but we should also consider what will best promote health and morality, elevate character and confer the greatest blessings on mankind.

J. H. M. EDWARDS: I wish to approve of the views expressed in the paper. Would like time to discuss it.

The time having arrived for adjournment, the society adjourned to meet at Red Oak on the third week in December, 1901. The members of the society were shown through the city in carriages, stopping en route to visit the factories seed houses and large nurseries located there.

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INDEX.

PAGE

Abele 259, 505
Acer Ginnala. 504
Acer Schwerdleri..... 369, 504
Address of welcome, Southeastern Society. 243
Adaptation of soils to various fruits..... 574
Advantages of union in efforts..... 355
A little heaven on earth 255
An object lesson in evergreen growing..... 409
Anthracnose of raspberry..... 180
Antisdel, H. N., permanent improvements..... 474
Another year with small fruit. 463
Are we doing our best..... 411
Arricle "2" of the I. S. H. Society..... 134
A study on fruit bloom. 222
Asparagus 402
Asparagus culture..... 347
Apples, distribution of 55, 88
Apples in Minnesota..... 425
Apples and other fruit in Wisconsin..... 408
Apples, hardy 56
Apples, maps showing distribution of..... 58-71
Apples, Russian..... 54, 468
Apples, seedlings 88, 156, 157, 158, 515
Apples, top grafting. 160
Apples, discussion on 55
Alma..... 378
Allen's choice..... 368, 382
Alaska (crab)..... 54, 376
Alexander..... 31, 435
Apple of commerce..... 87, 188
Anis..... 56, 420
Anisim..... 417, 427, 455
Antonovka..... 51, 54, 63, 64, 368, 369, 417, 420, 427, 435
Aport..... 467
Arkansas..... 88, 188
Arkansas Beauty..... 88
Arkansas Belle..... 188
Autumn Strawberry..... 324
Autumn Aport..... 418
Avista..... 378
Babbit..... 56
Banana..... 87
Baldwin..... 328, 515, 517
Beach 87, 188
Ben Davis..... 40, 49, 51, 66, 68, 70, 255, 322, 324, 328, 330, 331, 336, 338, 373, 376, 392, 393, 422, 435, 455, 461, 473, 487, 492, 508
Ben Davis Sweet..... 389
Ben Davis No. 3..... 389, 452
Benoni..... 66, 68, 70, 201

Digitized by Google

Apples, discussion on PAGE
Bert ... 490
Big Estray ... 202
Black Annette ... 43, 54, 67, 70, 84, 325, 422, 435
Black Ben Davis ... 88, 188
Black Oxford ... 392, 393
Borovinka ... 63, 64, 368, 417
Bogdanoff ... 468, 469
Boiken ... 469
Breskovka ... 51
Briar's Sweet (crab) ... 52, 158, 173, 202, 293, 393
Brilliant ... 156, 479
Canada Red ... 54
Charlamoff ... 51, 52, 54, 63, 65, 173, 368, 382, 393, 492
Cole's Quince ... 70, 71, 393, 435
Collins ... 188
Colton (early) ... 87, 165, 368, 393
Crimea Bog ... 54, 468
Cross ... 368
Domine ... 66, 68, 70
Dominition Winter ... 378
Duchess No. 4 ... 157
Duchess No. 6 ... 156
Duchess of Oldenburg, see Oldenburg.
Dudley's Winter ... 378, 379
Early Washington ... 435
English Golden Russet ... 202
English pipin ... 469
Etris ... 188
Eureka ... 378
Excelsior ... 5
Fall Orange ... 66, 69, 70
Fall Queen ... 435
Fameuse ... 43, 48, 51, 53, 54, 66, 68, 70, 381, 408, 417, 433, 436
Fameuse No 1 ... 156, 323, 389
Florence (crab) ... 54
Fonaric ... 393
Fulton ... 468
Gano ... 40, 50, 66, 68, 70, 188, 324, 382, 422
General Gregg ... 54
Gipsy Girl ... 51
Given ... 188
Good Peasant ... 54, 469
Green Crimean (No. 399) ... 368
Grimes Golden ... 47, 49, 70, 71, 87, 202, 324, 338, 374, 393, 422, 435, 455, 468
Gros Mogul ... 468
Gros Pomier ... 202
Haas ... 51, 55, 54, 56, 301, 368, 392, 493
Hibernal ... 56, 366, 367, 368, 374, 377, 427, 436, 449, 451, 474, 478
Hoardly ... 378
Howard Sweet ... 188
Hutchin's Red ... 90
Hutchin's Sweet ... 90
Hyslop (crab) ... 53, 202
Iowa Beauty ... 54, 90, 479
Iowa Blush ... 32, 70, 71, 325, 338, 368, 382, 392, 493
Ingram ... 38, 40, 91
Janet, see Rawle's Janet.
Jonathan ... 43, 47, 66, 68, 70, 85, 87, 201, 323, 324, 336, 374, 393, 435, 455, 468
Jeffries ... 56
Kaump ... 51, 63, 65, 368, 376, 369, 392, 436, 473, 478, 484, 493
Lady Sweet ... 188

Digitized by Google

Apples, discussion on PAGE
Lake's Winter ... 376
Lawrence ... 478
Lawver ... 368, 517
Lead ... 469
Liveland Raspberry ... 422
Longfield ... 51, 52, 53, 54, 56, 368, 374, 392, 401. 408, 417, 422, 436, 455, 478, 492
Lou (crab) ... 54
Lowell ... 66, 69, 70
Lubsk Queen ... 417
Maiden Blush ... 48, 66, 69, 70, 85
Malinda ... 32, 33, 34, 35, 37, 52, 53 54, 57, 61, 371, 374, 378, 424, 436. 478, 490
Mammoth Black Twig ... 40, 88, 188
Mann ... 433
Martha (crab) ... 52, 54
McMahon ... 63, 65, 324, 408 424
McIntosh Red ... 417
Mercer, (crab) ... 165
Minkler ... 66, 67, 70, 324
Ness ... 478
Never-fail ... 435
Newport ... 89
Newell, ... 378, 435
New York Pippin ... 41, 393
No. 590 M ... 54
No. 413 ... 54
No. 27 ... 85
No. 67 ... 86
Nos. 1-10-17-18-28-31-35-63-78-88-110 ... 86
No. 4 A ... 478
Northwestern Greening ... 50, 52, 53, 56, 57, 58, 126, 323, 324, 330, 338, 366, 373, 374, 376, 377, 378, 382, 407, 422, 424, 433, 436, 451, 473, 478, 483, 492
North Star ... 452
Okabena ... 378
Oldenberg .. 31, 32, 33, 48, 49, 50, 51, 52, 53, 54, 56, 85, 173, 202, 323, 324, 366, 376, 382, 390, 393, 401, 408, 417, 424, 433, 436, 449, 473, 474, 478, 483, 490, 492, 548
Oliver Red ... 88, 188
Osceola ... 176
Ostrakoff ... 435
Patten's Greening ... 32, 52, 53, 54, 56, 63, 65, 89, 287, 293, 366, 368, 378, 393, 411, 417, 427, 436, 478, 492, 548
Peach ... 436
Peerless ... 126, 373, 378
Peter ... 54, 427
Perry Russet Seedling No. 3 ... 156, 389
Pewaukee ... 49, 54. 57, 60, 392, 393, 435, 473
Plumb's Cider ... 48, 51, 54, 56, 368, 369, 382, 433, 436, 451, 461, 478, 483, 492
Pointed Pipka ... 52
Porter ... 435
Quince ... 478
Rambo ... 89
Ramsdall Sweet ... 66, 67, 70
Rankin ... 435
Rawle's Janet ... 34, 40, 43, 70, 71, 319, 321, 330, 338, 368, 508
Recumbent ... 54
Red Astrachan ... 56, 324
Red June ... 69, 70
Red Queen ... 469
Red Warrior ... 435, 478
Regan ... 88, 188
Repka Malenka ... 366, 368, 378, 392, 468
Repka Aport ... 469

Digitized by Google

	PAGE
Apples, discussion on	
Rhode Island Greening	328
Rome Beauty	324, 422, 468
Roman Stem	66, 69, 70, 176, 324, 338, 382
Romna	56
Russet	54
Salome	50, 56, 59, 330, 331, 368
Scott's Winter	63, 64, 435
Seek-no-Further	379
Senator	40, 88, 188
Sheriff	70, 71
Shield's Crab	376
Shrute	435
Siberian Crab	54
Silken Leaf	54, 176, 435
Soulard Crab	85
Speer	202
Springdale	88
Stayman Winesap	39, 40
St. Lawrence	368
Sweet June	66, 67, 70, 324
Tetofsky	52, 53, 54, 56, 368, 387, 408, 436, 478, 484, 487, 490
Tolman Sweet	52, 66, 70, 368, 408, 433
Transcendent (crab)	53, 202
University	35, 89, 479
Utter's Red	54, 66, 69, 70, 378
Vassil's Largest	393
Vargulick	54
Varonish	435
Varonish Cross	468
Varonish Rebka	469
Varonish Rosy	469
Vena Rosa	51
Vilna Antonovka	202
Virginia Crab	54, 201, 374, 376, 380, 392, 393, 420, 473
Wagener	325, 509
Walbridge	52, 53, 54, 56, 338, 368, 382, 392
Warren	90
Wealthy	31, 32, 48, 49, 51, 52, 53, 54, 56, 286, 323, 324, 330, 366, 369, 371, 374, 376, 379, 382, 392, 393, 401, 408, 417, 422, 424, 427, 428, 436, 449, 455, 473, 474, 478, 483, 488, 490, 492
White Winter Pearmain	33, 35, 88, 328
White Pippin	325
White Queen	435
Whitney	31, 32, 33, 51, 52, 54, 56, 202, 323, 324, 368, 382, 392, 393, 401, 433, 436, 473, 474, 478, 492
William's Favorite	393, 435
Windsor	132, 323, 325, 330, 379, 422
Winesap	39, 70, 71, 328, 393, 435, 508
Willow Twig	43, 47, 49, 51, 61, 255, 286, 323, 336, 338, 392, 393, 435
Winter Streiffling	468
Wolf River	53, 54, 56, 368, 378, 408, 417, 424
Yellow Transparent	48, 52, 54, 56, 197, 323, 324, 368, 382, 408, 435, 483, 487, 492
York Imperial	551
Zuzoff	417, 468
Bacon, Geo. S., some new strawberries and red raspberries	73
Barnhill, O. H., some advantages of horticulture	558
Barrett, Richard C., the farm and the school	113
Bents, A. E., my experience in the first garden	394
report as delegate to the Wisconsin Horticultural Society	427
Berry notes	557
Berbery	369, 504, 505

Digitized by Google

PAGE
Birds and their relation to horticulture. ... 505
Black knot. ... 91, 182
Blodgett, C. G., directors' report first district ... 42
after culture of the strawberry ... 211
notes of the season. ... 318
Blackberries, discussion on ... 341
Ancient Briton. ... 86, 441
Erie ... 86
Early Harvest ... 423
Eldorado ... 341, 408
Stone's Hardy ... 341
Snyder. ... 52, 54, 341, 423, 441, 461
Wilson's Early. ... 86
Board meeting ... 189
Bomberger, W. M., treasurer's report, State Society ... 27
article 2, I. S. H. Society. ... 134
top grafting notes ... 199
secretary's report ... 527
Bordeaux mixture. ... 179
Branson, Abner, directors' report, second district ... 43
report of experiment station. ... 163
care of orchards between five and twenty-five years of age ... 198
lesson on small fruit ... 340
Bryant, A. W., remarks by ... 287
on spraying ... 325
Budd, Prof. J. L., outcome of crossing fruits and shrubs in the Northwest ... 176
cold storage for fruits ... 416
some varied fruit topics ... 467
colored and variegated trees and shrubs for ornamental planting. ... 503
Buffington, A. J., the apple cutting ... 358
Burnap, W. A., why plant a tree? ... 102
what may we expect of the Northwestern Greening apple? ... 374
report as delegate to Minnesota State Society, 1899 ... 225
working and waiting in Northeast Iowa ... 477
Burton, C. W., secretary's report ... 248
Burning bush ... 504
By-laws, State Society ... 17
Canning fruit. ... 536
Care in propagation ... 352
Care of orchards between five and twenty-five years of age ... 198
Carolina poplar ... 259, 490, 505
Callison, J. A., the rose garden ... 152
interest in horticulture, how to promote it ... 219
Catalpa ... 475, 476
Causes of failure ... 252
Caulkins, A. S., another year with small fruit ... 462
Cherry mildew ... 181
Cherries, up-to-date facts about ... 545
Cherries, varieties and cultivation ... 418
Cherries, Russian ... 164
Baldwin ... 140, 160, 545
Boquet Morello ... 368
Cerise de Ostheim ... 81, 164, 546
Choke cherry ... 52
Compass ... 372, 450
Double Notte ... 369
Dye house ... 545
Early Richmond ... 47, 52, 54, 227, 295, 302, 368, 378, 439, 449, 461, 493, 545
Early Morello ... 368
English Morello ... 46, 52, 81, 82, 493, 545
Late Richmond ... 302, 545

Digitized by Google

	PAGE
Cherries, Russian	
Late Montmorency	303
Lutuvka	368
Mahaleb	419, 467, 546
Mazzard	82, 419, 467, 545, 546
Montmorency	43, 46, 47, 302, 378, 439, 493, 545, 546
Montmorency Ordinaire	47, 303, 546
Morello	546
Northwest	140
No. 23, Orel	164
Ostheim	402, 439, 493, 545, 546
Prunus Besseyi	456
Pennsylvanica	419, 467
Sand cherry (see plum)	53, 456, 457
Silver Thorne	303
Spate Morello	164, 368
Terry	546
Valdmier	368
Wragg	46, 52, 53, 81, 402, 439, 449, 493, 545
Chestnuts	534
Clemons, L. A., report as delegate to the Northeastern society	450
fruit for the farm	482
Cold storage for fruits	416
Colored and varigated trees and shrubs for ornamental planting	503
Collman, A. F., report as delegate to Missouri state society	91
the lawn	150
selecting fruit for exhibition	208
Commercial orcharding	483
Cornus Sanguinea	505
Committees in state society	29, 42
Northeastern society	372
Northwestern society	454
Commercial, orcharding, third year's experience in starting	335
Constitution State society	16
Cottonwood	259, 474, 552
Craig, Prof. John, orchard cover crops	203
Report of co-operative experiments	207
Cross fertilization	164
Councilman, S. J., horticulture, its relations to the home	110
Cownie, Hon. John, remarks by	141
Currants	
Champion	441
Lee's Prolific	441
Long Bunch Holland	441
Knight's Improved	54
North Star	441
Pomona	46, 161
President Wilder	161
Red Dutch	52, 54
Victoria	46, 52, 161, 401, 441
White Dutch	441
White Grape	46, 52, 54
Cut-leaved Birch	262, 490, 503, 555
Dart, E. H. S., which are the best timber trees for the middle northwest	393
Davenport, W. J, transportation	517
Delegate to the department of agriculture	216
Delegates—See reports of.	
Dennis, Dr. A. B., great need in plum culture	320
Desirable flowering plants and shrubs	405
Dew berries, discussion on	465
Bartel	465
Lucretia	86, 465
Salzer's Mammoth	465

Digitized by Google

PAGE
Directors' reports, State Society....42-55
Summary of, in auxiliary societies....252, 365, 449, 512
Discussion on apples.... 55
Asparagus culture.... 348
Blackberries.... 341
Grass in orchards....271, 276
Orchards.... 379
Plums....79, 299
Plums, peaches and cherries.... 299
Pollination.... 128
Raspberries.... 341
Spraying....98, 480
Strawberries....74, 385
Strawberry culture....316, 340
Sweet potato culture.... 349
Trees and shrubs....107, 258, 370
Tree planting.... 314
Transporting children to school.... 118
Duckworth, W. A., fertilization of fruit.... 293
Dwarf Juneberry.... 407
Eden, Geo. W., peach and plum in southeastern Iowa.... 289
Edwards, A. J., remarks from.... 29
Elder, Miss Jennie, report from.... 54
Election of officers, state society.... 101
Northwestern society.... 485
Southwestern society.... 549
Erwin, A. T., Pollination of fruits.... 127
Plant breeding.... 409
Spraying.... 479
Experiment stations.... 9
Evergreens.... 218
Arbor Vitae....218, 265, 266, 433, 471
Austrian pine....265, 266, 470, 555
Black Hills Spruce.... 265
Black Spruce....218, 433, 470, 472, 555
Blue Spruce....264, 470, 471, 503
Chinese Golden Arbor Vitae.... 433
Concolor fir....218, 433, 473
Douglas Spruce....318, 433, 471
Hemlock....267, 433, 471
Larch, American.... 294
Larch, European....266, 294
Norway Spruce....264, 265, 470, 471, 555
Red Cedar....218, 264, 265, 266, 433
Rocky Mountain Dwarf Pine.... 433
Scotch Pine.... 265, 394, 428, 470, 472, 555.
Silver Spruce.... 218, 503
White Pine.... 108, 218, 264, 267, 472, 555, 557.
White Spruce....218, 265, 470, 471, 473, 555.
Facts learned this Season.... 550
Felter, H. L., Juneberries.... 466
Ferris, B. F., director's report 9th district.... 49
The six best apples for the family orchard, two summer, two fall and two winter.... 382
Ferris, J. C., Profits in early fruits.... 197
Fertilization of fruits.... 293
Fifteen years with Russians.... 386

Digitized by Google

PAGE
Figs in Iowa 173
Floral decorations 523
Fluke, N. K., Director's report 4th district 45
Notes on new fruits 85
Forestry as a national problem 228
Forster, John, causes of failure 252
Fruit districts 8
Fruit for the farm 482
Fruit growing in Iowa, fifty year of 327
Fruit growing in Woodbury county 460
Fruit growing in Northwestern Iowa 197
Fruit growing in Palo Alto county 485
Fruit list Southeastern society 346
Northeastern society 431, 441
Northwestern society 491, 495
Fruit list in Minnesota 425
Fruitman, resolution endorsing 132
Fungus 55, 92
Fultz, W. S., president's address 246
Gano, W. G., remarks by 29, 39, 167
Gardner, C. F., president's address State society 23, 192
Northeastern society 397
Gaylord, Edson, are we doing our best 411
Gilles, Jas. R., my horticultural troubles 337
Gladiolus 405
Grapes killed 162
Grape growing, will it pay 549
Agawam 440, 495, 541
Brighton 401, 440, 495, 541, 551
Clinton 495
Concord 52, 54, 374, 440, 495, 541, 550
Cottage 495
Early Ohio 495
Early Victor 541
Eldorado 541, 551
Hartford 495
Isabella 322
Janesville 495
McPike 551
Moore's early 52, 54, 374, 401, 495, 541, 550
Munson's Hybrids 169
Niagara 401, 440, 495
Pocklington 495, 541, 550
Worden 52, 54, 374, 401, 495, 541, 550, 551
Gooseberries,—
Downing 46, 52, 161
Houghton 52, 53
Pearl 53, 161
Golden Glow, Rudebeckia 416
Graham, M. J., some new varieties of apples and pears 87
Greene, W., secretary's report, State society 23
Distribution of apples 55
Report as delegate to Illinois 185
A study on fruit bloom 222
Lesson on trees, etc 258
Floral decorations 523
Griffin, J. S., the outlook 487
Guilford, W. H., cherries, variety and cultivation 418
Report as delegate to the Southeastern society 422
Holsinger, Maj. Frank, remarks by 29, 38, 167
Hardy plants for busy people 415

Digitized by Google

PAGE
Handley, James, Advantages of union in efforts 355
Hansen, N. E., The breeding of native Northwestern fruits 455
Hatfield, A. W., Fruit growing in Woodbury county 460
report on forestry 552
Harrington, F. O., Instruction in tree planting 307
persimmon report 344
Harris, J. S., The way to successful orcharding in the northern fruit belt 419
Herbst, J. L., The Wisconsin trial orchard. 378
Hinds, R. E., Third year's experience in starting a commercial orchard 335
Hinkley, M. E., Influence of the local nurseryman. 216
appointed delegate to the department of Agriculture 216
Hippophea Sibirica 504
Historical reminiscences 531
Hodson, Elmer R. Some notes on Fungus diseases 178
Holmes, Samuel, Berry notes 551
Honeysuckles 194, 416, 504
Hoopes, J. E., Asparagus culture 347
Hoopes, Emerson, Sweet potato culture 349
Horticulture, its ralation to the home 110
Horticulture, some ideas on 270
Horticulture, the other side 331
Horticulture, present and future in the upper Mississippi valley 304
Horticulturists should carefully study the laws which govern living trees and herbaceus plants 170
How to plant our gardens so as to have a supply of fresh vegetables from spring until late in fall 214
How to grow strawberries 519
How to supply a family with fruit from a town lot 401
How to get the public interested in growing small fruit 538
Influence of the local nurseryman 210
Interest in horticulture, how to promote 219
Iris 415
Insects, leaf roller 209, 212
Irrigation 540, 550
Instruction in tree planting 307
Ivins, G. A., The four best strawberries and how to cultivate them successfully 382
treasurer's report 429
Jackson, J. P., director's report third district. 45
report of experiment station 163
peach culture in southwestern Iowa 214
president's address 525
Japan quince 196, 270, 416
Japan walnuts 534
Juneberries 441, 466
Kellogg, Geo. J., protection of nursery stock from injury by winters. 395
Kenyon. O. A., fifteen years with the Russians 386
Kinnie, P. F., director's report tenth district 51
report of experiment station 169
growing fruit in northwestern Iowa 197
president's address 454
Labor in horticultural operations 541
Langham, William, snap shots 279
Larch 475, 476
Lathrop, H. W., remarks by 31, 36
response to address of welcome 245
fifty years of fruit growing in Iowa 327
Laughlin, W. B., historical reminiscences 531
Lesson on trees and shrubs 358
plums, peaches and cherries 299
the apple 322
small fruit 340

Digitized by Google

PAGE
Letters read in Southwestern society ... 533
Liburnum lantana ... 504
Little, E. E., report on spraying ... 96
Lonicera media ... 504
Map showing distribution of apples ... 56-71
mean annual temperature ... 72
temperature of April ... 223, 224
Marshall, A. G., shade and ornamental trees ... 554
McGeehon, R. D., how to grow strawberries ... 519
Meeting newer conditions ... 542
Members, list in State society ... 11
Southeastern society ... 241
Northeastern society ... 363
Northwestern society ... 445
Southwestern society ... 499
Michener, H. H., peaches ... 288
Mistakes in planting ... 83
Mildew—powdery of the cherry ... 181
Miller, G., new fruits and experiments ... 515
Moore, O. W., remarks by ... 371
My case stated ... 279
My horticultural troubles ... 337
My experience in the fruit garden ... 394
Native trees about our homes ... 217
New fruits and experiments ... 515
Notes on climatology of Iowa ... 145
Notes on new fruits ... 85
Notes of the season ... 318
Nut culture ... 534
Oaks ... 106, 109, 218
Officers of the State society ... 7
Southeastern society ... 240
Northeastern society ... 362
Northwestern society ... 445
Southwestern society ... 499
Old and new facts in grape growing ... 540
Orchard cover crops ... 203
Orchard management ... 508
Orchard pests ... 278
Ornamental planting around public buildings and grounds ... 537
Outcome of crossing fruits and shrubs in the northwest ... 176
Pammel, Dr. L. H., Resolution on forestry ... 93
what kind of work the state horticultural society should do to promote the interest of horticulture in Iowa ... 94
Some desirable flowers for the lawn ... 194
Forestry as a National problem ... 228
Pan American Exposition ... 121
Patten, C. G., Remarks by ... 33, 37
Report of Experiment station ... 156
Present and future of horticulture in the Upper Mississippi Valley ... 304
Things new in seedling production ... 388
Patterson, D. B., How to plant our gardens so as to have a supply of fresh vegetables from spring until late in fall ... 214
Pease, F. E., Tulips ... 216
Peaches ... 288
Peaches, discussion ... 509
Peaches and plums in southeastern Iowa ... 283
Peach culture in southwestern Iowa ... 214
Alexander ... 511
Bakara No. 3 ... 318, 339, 511
Bailey ... 165, 288, 289, 292, 297, 298, 390

Digitized by Google

	PAGE
Peach culture in southwestern Iowa	
Bent's Seedling No. 2	289
Champion	318, 423, 510
Crosby	318, 510, 511
Early Crawford	510
Early Rivers	511
Elberta	510
Ellison	510
Friday	43, 44, 288, 423
Hill's Chilli	510
Mountain Rose	510
Triumph	511
Pear blight	184
Bartlett	87
Bessemanka No. 418 and 413	368
Bricket	48
Gakovska	368
Japan Golden Russet	175
Kieffer	48, 175, 368, 423
Koonce	88
Lexington	88
Lincoln Coreless	88
Longworth	48
Mendenhall	88
Mongolian Snow	88
Sugar pear	174
Vermont Beauty	88
Warner	48
Warden Seckle	88
Zucker Birne	174
Peck, E. F., remarks by	317
Pellet, Frank, Birds and their relation to horticulture	505
Permanent improvements	474
Perennials and annuals	407
Persimmon report	344
Plant breeding	409
Plum culture	489
Plum culture, great need of	320
Plums for Iowa	76
Plums in Wisconsin	408
Plum pockets	183
Plum rot	179
Plum spot	185
Plums, lesson on	299
Americana	141, 306
Abundance	77, 408
Aitken	161, 165, 378
Alpha	86
Barnsbeck	161
Beatty	78, 140, 161, 321
Bestofell	161
Betta No. 4	86
Blue Damson	44
Brittlewood	78
Brown's Seedling	289
Burbank	77, 300, 400
City	483
Charles Downing	140, 163
Champion	140, 321
Cheney	79, 408
Cherry	489
Cling Stem	162

Digitized by Google

Plums, lesson on PAGE
Comfort ... 378
Cumpass cherry ... 372
Damson ... 302, 321
Davenport ... 86
Deaton ... 77
De Soto ... 44, 46, 47, 50, 52, 54, 78, 80, 81, 82, 83, 86, 161, 163 300, 302, 378, 401, 408, 411, 438, 449, 490, 494
De Soto seedling ... 289
Downing ... 78, 83
Early Minnesota ... 487
Early Red ... 54
Forest Garden ... 47, 78, 300, 301, 378, 408, 438, 490, 494
Free Silver ... 78
Fasawattamie ... 162, 291
Gamma No. 6 ... 86
Garfield ... 321
German prune ... 77
Golden Beauty ... 161, 321
Goosedye ... 391
Green Gage ... 302
Hammer ... 140, 163
Harris ... 378
Hawkeye ... 47, 78, 81, 82, 83, 161, 163, 299, 321, 378, 401, 408, 438, 489, 494
Imperial ... 162
Iowa ... 489
Japan Hybrid No. 2 ... 399, 400, 478
Klondyke ... 307
Lombard ... 53, 77, 302, 339
Mankato ... 161
Marcus ... 378, 489
Marianna ... 79, 82, 83, 296, 301, 369
McKinley ... 162
Merunka ... 77
Milton ... 83, 139, 300, 301
Miner ... 45, 48, 52, 78, 80, 140, 163, 300, 306, 439, 449, 494
Mirabelle ... 368
Moreman ... 321
Myrobolan ... 79, 296, 369
Neals ... 489
New Ulm ... 140, 161, 489
Newman ... 321
No. 3 ... 176
Ocheeda ... 161, 489, 494
Odegard ... 161
Omega ... 321
Pilot ... 378
Poole's Pride ...
Pottawattamie ... 139
Peach ... 489
Prunus, Triflora ... 76
Americana ... 77
Domestica ... 77
Red Gage ... 44
Robinson ... 139
Rockford ... 78, 401, 438
Rollingstone ... 165, 378, 408, 489
Tatage ... 45, 77
Troesel ... 48
Sand Cherry ... 53, 141, 456
Snook ... 140
Speer ... 47

Digitized by Google

Plums, lesson on PAGE
Stoddard.. .. ..47, 78, 161, 299, 321, 439, 490, 494
Surprise ..161, 378
Terry ..221
Weaver ..80, 86, 339, 378
Wickson ..77
Whitaker ..161
Wild Goose..44, 45, 78, 139, 300, 301, 339, 494
Wolf..46, 48, 53, 54, 78, 165
Wyant..46, 48, 52, 78, 80, 81, 82, 163, 165, 299, 321, 378, 401, 408, 438, 489, 494, 516
Wood..489
Yellow Moldavka ..77, 368
Yellow Transcendent ..140
Plumbly, Silvan, some undesirable importations..382
Plummer, A. L., director's report 6th district ..47
Pottasium Sulphide solution ..179
Pollination of fruits ..127
Practical thoughts suggested by the experiences of 1900..402
Price, C. D., Fruit growing in Palo Alto county ..485
Proceedings of summer meeting. ..192
Southeastern society 239
Northeastern society ..361
Northwestern society..449
Southwestern society ..503
Profit in early fruits ..197
Premium list, state society.. ..20
Northeastern society ..364
Northwestern society..447
Southwestern society.... ..501
President's address, state society ..23, 192
Southeastern society..26
Northeastern society ..397
Northwestern society ..454
Southwestern society..525
Protection of nursery stock from injury by winters ..395
Prunus Padus accubifolia..504
Pissardii ..505
Pyrus Aria Nivea ..504
Pyrus Malus ..85
Iowensis ..95
Taringo..177
Ringo..177
Coronaria..177
Question box..490
Raspberry Anthracnose ..180
Raspberry plants after harvest, care of..213
Raspberries, discussion on..341
Columbian..74, 341, 401, 441
Conrath..161, 341, 369, 463
Crimson Beauty..463
Crimson Cluster..75, 449
Cumberland ..161, 341, 365
Cuthbert ..53, 73, 450
Eureka..141, 341, 441, 463
Golden Queen ..463
Gregg..341, 371, 441, 463
Hilborn ..161
Kansas ..52, 161, 341, 409, 441
Kenyon..74
Loudon..52, 73, 74, 75, 369, 372, 425
Lotta..140, 161

Digitized by Google

	PAGE
Raspberries, discussion on	
Marlboro	409, 425
Miller	371
Nemaha	409, 441
Ohio	425, 441
Older	52, 53, 161, 341, 369, 401, 425, 463
Palmer	341, 441
Pitt's Seedling	463
Philadelphia	369
Progress	161
Royal Church	450
Turner	52, 369, 425, 441, 450
Wallace	341
Reeves, Elmer, native trees about our homes	217
Report as delegate to southern Minnesota society	373
Director's report	51
Relation of horticulture to agriculture	513
Report of committee on president's address, State society	122
Northeastern society	401
Southwestern society	539
Report of committee on secretary's report, State society	123
Southwestern society	539
Report of committee on awards, State society	124
Southwestern society	539
Northwestern society	476
Northeastern society	430
Report of committee on improvements needed at the state fair grounds	133
Report of committee on resolutions, State society	155
Northeastern society	428
Northwestern society	485
Southwestern society	551
Reports of delegate to Missouri State society	91
Illinois State socitey	185
Minnesota State society	35
Southern Minnesota society	125, 375
Minnesota State society	425, 427
Wisconsin State society	424
Northeastern society	450
Southeastern society	422
Report of committee on treasurer's report, State society	123
Northeastern society	431
Northwestern society	477
Southwestern society	540
Report on the blooming of fruit trees	225
Report on spraying	96
Report on forestry	552
Report of experiment station at Charles City	156
Waukee	195
New Sharon	163
Glenwood	163
Cedar Falls	164
Storm Lake	169
Ames	207
Resolution on forestry	93
Resolution endorsing the fruitman	132
Resolution to increase appropriation	132
Richman, Hon. Frank, address of welcome	243
Robertson, Prof. Wm., remarks by	100, 120
Roses	406, 410, 416, 538, 525
Rowe, Samuel, some ideas on horticulture	270
Rules, State society	18
Russian apples	54, 469

Digitized by Google

PAGE

Sage, J. R., notes on climatology of Iowa ... 145
Sand plum ... 535
San Jose scale, benefits of to Iowa ... 142
Secretary's report, State society ... 25
Southeastern society ... 248
Northeastern society ... 421
Southwestern society ... —
Schroeder, Henry, figs in Iowa ... 173
a little heaven on earth ... 255
Secor, Eugene, director's report ... 52
some trees adapted to northern Iowa not generally planted ... 104
report as delegate to Southern Minnesota society ... 125
desirable flowering plants and shrubs ... 405
Seedling apples ... 164, 165, 176, 188
cherries ... 164
plums ... 176
gooseberries ... 177
roses ... 177
Seedlings for nursery work ... 296
Selecting fruit for exhibition ... 208
Shade and ornamental trees ... 554
Shank, Daniel, care in propagation ... 352
Sherbourne, Roland, seedlings for nursery work ... 296
lesson on plum, peach and cherry ... 299
Shontz, B, directors' report ... 48
winter protection for trees ... 206
commercial orcharding ... 483
Shrubs ... 194
Amalanchier ... 169
Berbery ... 369, 504, 505
Bittersweet ... 194
Burning bush ... 504
Buffalo berry ... 268, 504
Cornus Sanguinea ... 504
Cut-leaved Sumach ... 140, 269
Flowering Almond ... 270
Golden Elder ... 140, 269, 504
Hardy Hydrangea ... 268
Hippophlea Sibirica ... 504
Honeysuckle ... 194
Japan Quince ... 196, 270
Lead plant ... 195
Lilacs ... 268
Lonicera ... 194, 504
New Jersey Tea ... 195
Roses ... 152, 177, 178, 195, 268
Siberian dogwood ... 140, 269, 503
Shrubly cinquifail ... 194
Smoke tree ... 269, 270
Snowball ... 268
St. Johnswort ... 194
Strawberry bush ... 195
Staghorn sumach ... 195
Sumach ... 109, 195
Spireas ... 196, 268
Sweet Scented shrub ... 196
Trumpet creeper ... 195
Virginia creeper ... 195
Wahoo ... 194, 269
Weigelia ... 268
White Fringe ... 269

Digitized by Google

PAGE
Snap shots ... 276
Some new strawberries and red raspberries ... 73
Some newer varieties of apples and pears ... 83
Some trees adapted to Northern Iowa and not generally planted ... 104
Some observations during the season of 1900 ... 139
Some notes on fungus diseases ... 178
Some varied fruit topics ... 467
Some desirable flowers for the lawn ... 194
Some advantages of horticulture ... 558
Some undesirable importations ... 283
Spraying ... 164, 325, 396, 479, 552
Speer, R. P., director's report ... 48
Report of experiment station ... 164
Horticulturists should study carefully the laws of nature which govern living trees and herbaceous plants ... 170
Why the people of Iowa do not have one-third the apples they want ... 391
Speer, D. B., strawberry culture ... 315
Station Stock ... 163, 169, 170
Stocks for apples ... 165, 173, 201, 202
Stock sent to stations ... 163
Stocks ... 296
Sleigerwalt, W. F., mistakes in planting ... 83
Strawberries, discussion on ... 316, 340
Thinning plants, how and when should it be done ... 522
Strawberries, after culture of ... 211
Barton's Eclipse ... 162
Bederwood ... 52, 53, 73, 74, 75, 76, 340, 370, 385, 409, 424, 462, 464, 474, 520, 522
Bisel ... 75, 520, 522
Bismark ... 162, 370
Brandywine ... 163, 319, 370
Brunett ... 521, 462, 521, 522
Bubach ... 384, 462, 520
Capt. Jack ... 319
Charles Downing ... 465
Clyde ... 74, 75, 162, 319, 370, 385, 462, 464, 495, 520, 522
Crescent ... 52, 53, 73, 74, 75, 76 319, 384, 385, 462, 464, 474, 495, 520, 522
Cumberland ... 521
Cyclone ... 340
Enhance ... 73, 340, 370
Fountain ... 384
Gardner ... 340
Gandy ... 385, 462
Glen Mary ... 522
Haverland ... 384, 385
Jessie ... 465, 424, 462, 464
Lovett ... 52, 74, 76, 340, 464, 495, 520
Luther ... 162
Manchester ... 522
Marshall ... 370
Mitchell's Early ... 197, 409
Morgan ... 73
Nick Ohmer ... 370, 521
Parker Earle ... 340, 384, 462, 495 520
Poconoke ... 162
Ridgway ... 73
Robinson ... 384
Sample ... 73
Seaford ... 162
Senator Dunlap ... 521
Splendid ... 76, 162, 409, 464, 522
Staple ... 409

Digitized by Google

PAGE

Strawberries, after culture of
Van Deman ... 409
Warfield ... 54, 73, 75, 76, 319, 340, 384, 385, 409, 424, 462, 464, 474, 495, 520, 52
Wm. Belt ... 462, 522
Wolverton ... 73
Stuart, B., Why so many fail with evergreens ... 555
Summers, Prof. H. E., The benefit the San Jose scale has been to Iowa ... 142
Remarks on insects ... 209
Summary of director's reports, southeastern society ... 252
Northwestern society ... 449
Southwestern society ... 518
Northeastern society ... 365
Sweet potato culture ... 349
Tatum, E., Lesson on the apple ... 322
The Salome apple ... 330
The best six varieties of apples for the family orchard ... 382
The lawn ... 150
The rose garden ... 152
The farm and the school ... 113
The outlook ... 487
The Apple Cutting ... 385
The Wisconsin trial station ... 378
The best four varieties of strawberries and how to cultivate them successfully ... 383
The way to successful orcharding in the northern fruit belt ... 419
The Salome apple ... 330
The breeding of nature's northwestern fruits ... 455
Things new in seedling production ... 388
Thompson, Jasper, remarks by ... 380
Top working notes ... 199
Transportation ... 517
Treasurer's report, state society ... 27
Southeastern society ... 360
Northeastern society ... 429
Northwestern society ... 459
Southwestern society ... 530
Trees, discussion on ... 107
Lesson on ... 258
Abele ... 256
Ash ... 84, 555
Ash, black ... 218
Ash, white ... 218, 262
Ash, mountain ... 262, 264
Acer Ginnala ... 108, 504
Basswood ... 218
Balm-of-Gilead ... 260
Birch ... 108, 262, 433, 503, 555
Black Locust ... 107
Boxelder ... 83, 258
Buckeye ... 106, 264
Butternut ... 84, 106
Carolina Poplar ... 505
Camperdown Elm ... 262
Catalpa ... 83
Cottonwood ... 83, 109, 396
Cottonwood, varieties of ... 259
Cherry Birch ... 108
Coffee tree ... 105
Cockspur Thorn ... 104
Cut-leaved Birch ... 262, 264
Elm ... 260
Gray Willow ... 83
Hard Maple ... 218, 258, 261, 263, 264

Digitized by Google

	PAGE
Ash	
Hackberry	105, 109, 218. 555
Hickory	261
Honey Locust	105
Judas Tree	195
Linden	106, 218, 258, 555
Loudon Red Willow	369, 370
Lombardy Popular	83, 84, 259
Magnolia	263
Norway Maple	263
Oaks	106, 218
Poplars, varieties of	259
Pea Tree	106
Pin Oak	109
Prunus Macki	369
Quaking Asp	260
Schwedler's Scarlet Maple	369, 504
Silax Aurea	503
Soft Maple	83, 258, 263, 394
Tulip Tree	263
Walnut	106, 394, 555
White Elm	218, 258, 394
White Birch	108
Willow, Laural-leaved	107, 369
Wild Olive	84, 107, 504
Wild Black Cherry	105
Trigg, J. S., how to supply a family with fruit from a town lot	401
Report as delegate to the Minnesota society	427
True, C. H., secretary's report	431
Tulips	216, 415
Van Houten, Geo. H., The otherside of horticulture	331
Practical thoughts suggested by the experience of 1900	402
Meeting newer conditions	542
Relations of horticulture to agriculture	513
Vegetables, list of best	511
Watrous, C. L., Remarks by	33
Report as delegate to Minnesota society	35
Some observation during the season of 1900	139
Report of Experiment Station	169
Whinnery, Mrs. W. L, Hardy plants for busy people	415
Willard, W. O. Director's report	46
Care of raspberries after harvest	213
Winter protection of trees	206
Wilson, Hon. Silas, Remarks by	166
Why plant a tree	102
What may we expect of the Northwestern Greening apple	374
Why the people of Iowa do not have one-third the apples they want	391
Why so many fail with evergreens	555
Which are the best timber trees for the Middle Northwest	392
Wood, Joseph, Plum culture	489
Working and waiting in Northeastern Iowa	477
Worth, W. T. Adaptation of soils to various fruits	547
Wragg, M. J., Plums for Iowa	76
Report of Experiment Station	159
An object lesson in evergreen growing	469

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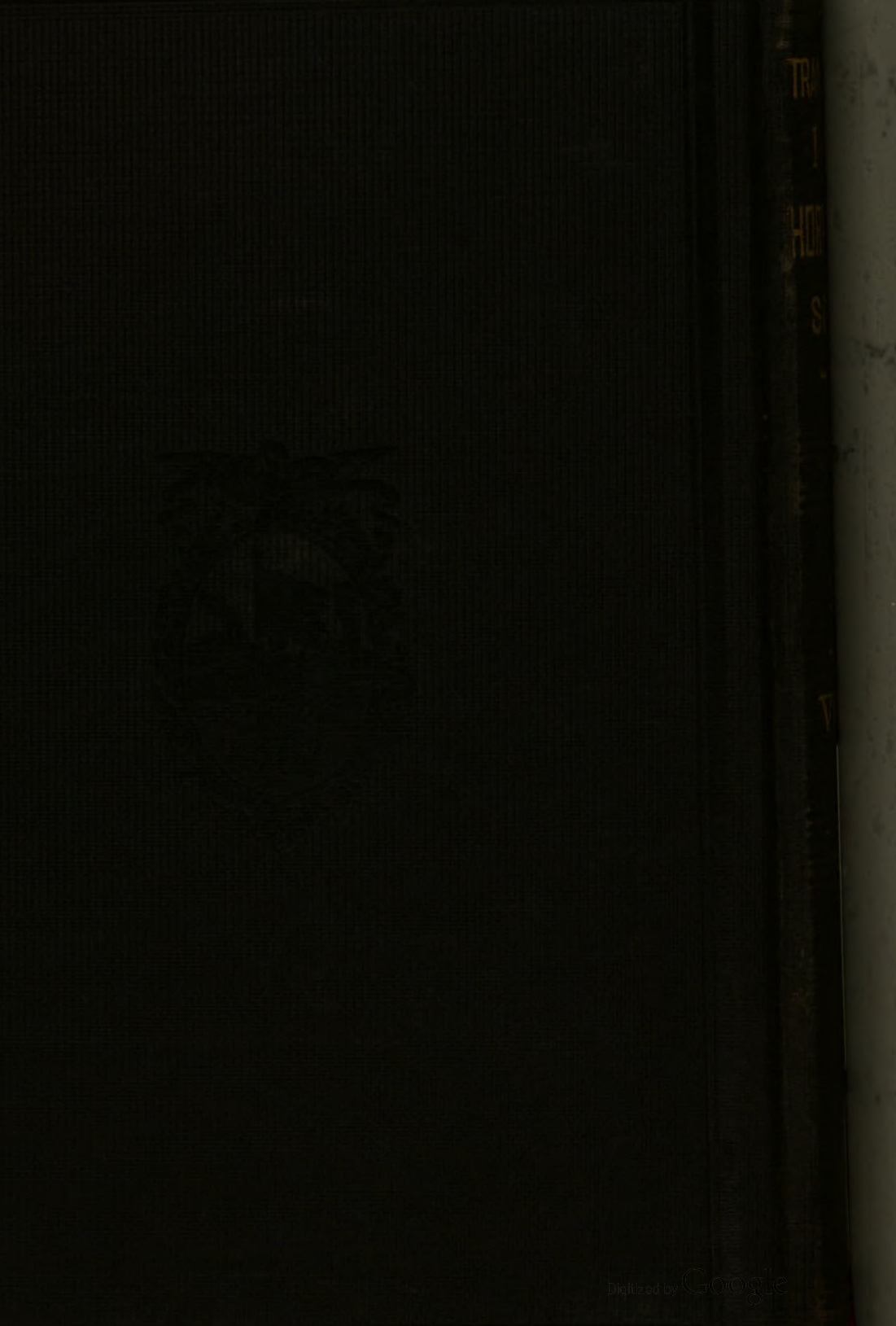
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